The Welding Engineer

Founded by L. B. Mackenzie, 1916

OCTOBER, 1925 VOL. 10, No. 10

$3.00 per year in U. S. 608 S. Dearborn St., Chicago, Ill. Reg. U. S. Pat. Office $4.00 per year abroad

Perhaps Your Cutting Cost Can Be Reduced Too

THE use of Airco 99.5% Pure Oxygen and the cooperation of the Airco Industrial Engineering Department have reduced the cutting cost in many foundries as much as 20%.

Airco gases, apparatus and Industrial Engineering cooperation are available through 17 Airco district offices.

Rapid cutting of risers ... Acetylene and Airco-Davis-Bournonville

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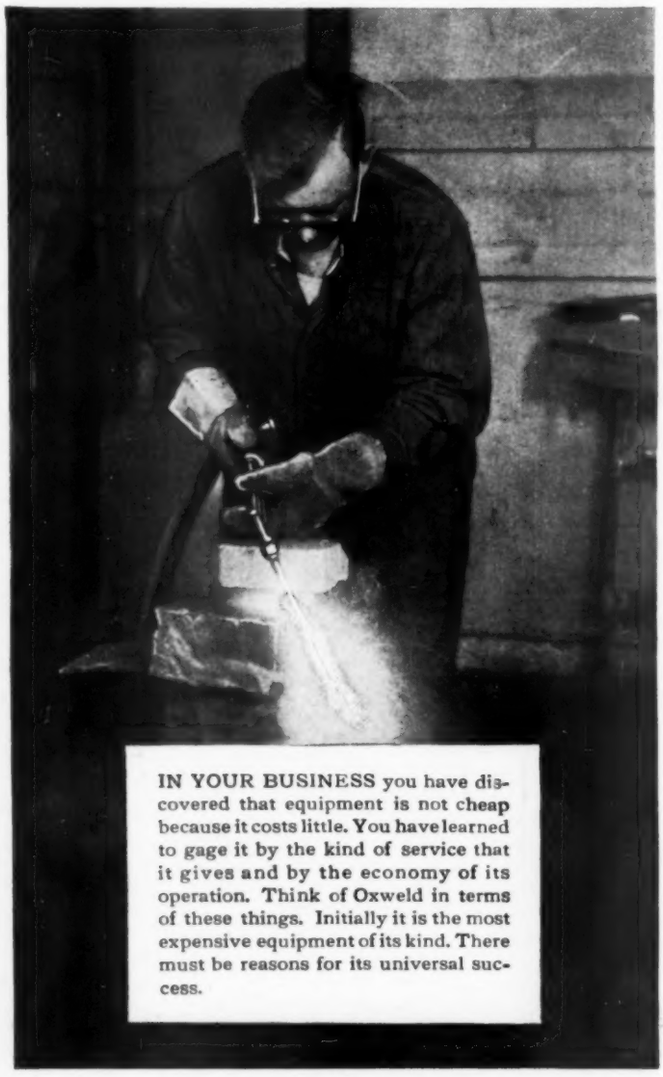
Is Oxweld equipment too expensive?



IN YOUR BUSINESS you have discovered that equipment is not cheap because it costs little. You have learned to gage it by the kind of service that it gives and by the economy of its operation. Think of Oxweld in terms of these things. Initially it is the most expensive equipment of its kind. There must be reasons for its universal success.

THE QUESTION is a legitimate one, especially as Oxweld is the highest priced welding and cutting equipment on the market. One of the soundest reasons for purchasing any equipment is that it is owned by a large majority of companies engaged in a highly competitive business. Such an endorsement for Oxweld comes out of the fact that there are over 575 scrap metal dealers who own Oxweld equipment.

The scrap metal business is proverbially a business of small margins. Dealers must buy and sell intelligently. Above all, they must handle the scrap economically. Their cutting tools and equipment must be serviceable.

In this kind of business over 575 dealers have purchased the most expensive equipment of its kind. This is, in effect, 575 endorsements of the statement that Oxweld is the most serviceable as well as the most economical cutting equipment on the market.

Oxweld Acetylene Company

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WELDING AND CUTTING APPARATUS

WORLD'S LARGEST MANUFACTURERS OF WELDING AND CUTTING EQUIPMENT

Fifty-Fifty Flames

"FIFTY-FIFTY" flames are the kind you want for efficient, economical welding and there's one sure way to get them —a Purox torch.

The two gases come together and are thoroughly mixed at the same pressure in the Purox mixer, producing the desired "neutral flame". The volume ratio, as revealed by studies of the United States Bureau of Standards, is actually 1.03 of oxygen to 1.00 of acetylene.

This means that your welding flame is a "fifty-fifty" flame, having no excess of either oxygen or acetylene and, consequently, neither oxidizing nor carbonizing in its effect.

Quick, efficient work, a solid weld and a satisfied customer are thus assured by welding with Purox.

If you want these things in your work, write the nearest Purox office for a torch catalogue and prices.

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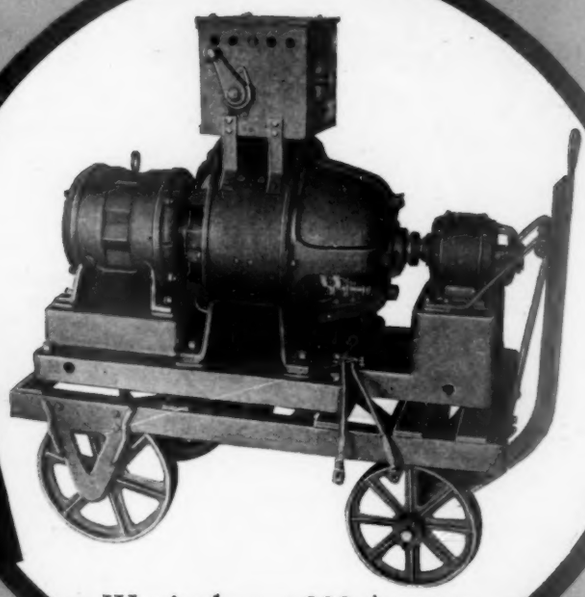
Only one rheostat need be adjusted to control entire welding range. No brush-shifting device necessary.

LOW MAINTENANCE
Sturdy simple construction with protected electrical units.

PORTABLE
Well balanced truck can easily be transported to location of work.

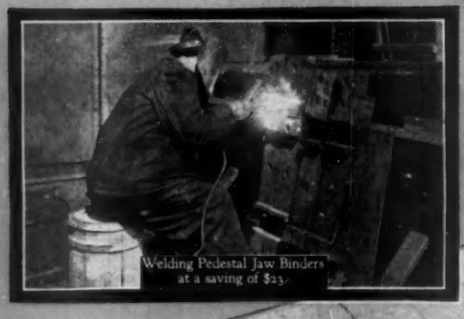


Westinghouse 200 Ampere Portable Arc Welder

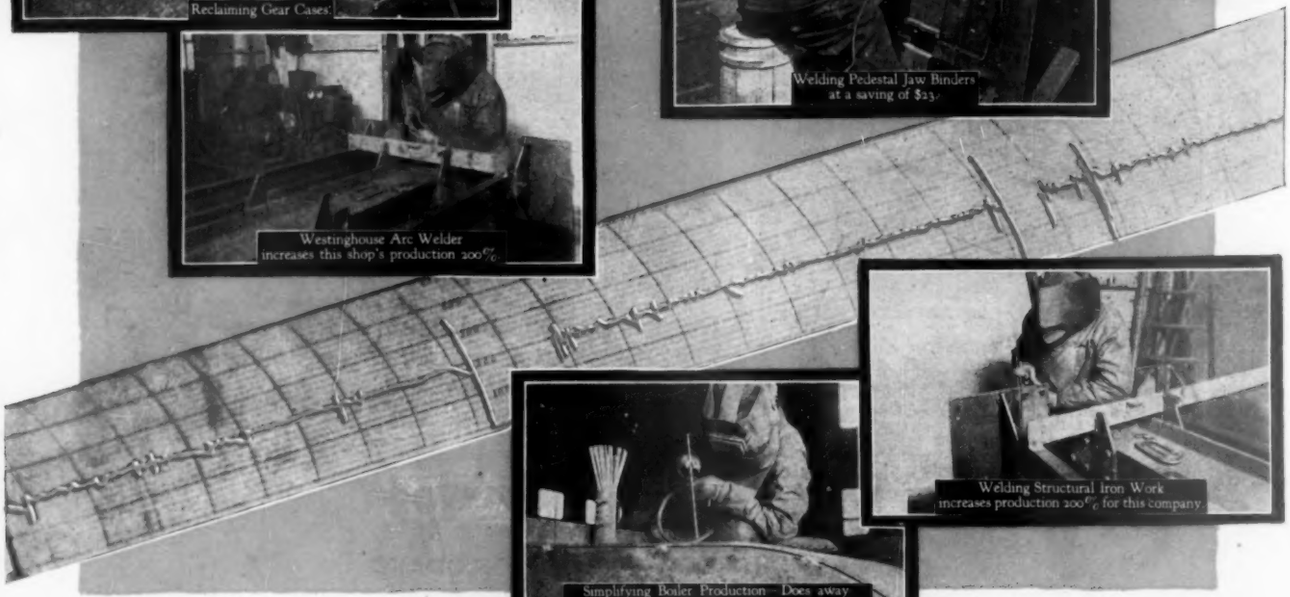
W WESTINGHOUSE ELECTRIC

Reclaiming Gear Cases

Westinghouse Arc Welder increases this shop's production 200%



Welding Pedestal Jaw Binders at a saving of $23.



Welding Structural Iron Work increases production 200% for this company

Simplifying Boiler Production—Does away with flanging and riveting and lowers labor costs

Westinghouse

X84330

for ECONOMY ~ *weld it Electrically*

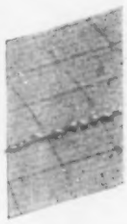
Typical Applications

Repair—
- Worn spindles
- Worn keyways
- Worn crabs
- Broken machinery
- Broken dies, cutters and punches

Production—
- Sheet metal work
- Structural steel
- Pipe lines
- Tanks
- Building up and joining all steel, cast iron, copper, brass or bronze parts.

WHEN metal breaks, don't scrap it—weld it electrically with the Westinghouse Portable Arc Welding Set. The saving on a single repair job often covers the cost of the set.

Whether it is a broken casting, a cracked cylinder, an expensive tool, or structural framework, the Westinghouse Portable Arc Welder is the "emergency man on four wheels" that mends the break on the spot, quickly and economically.



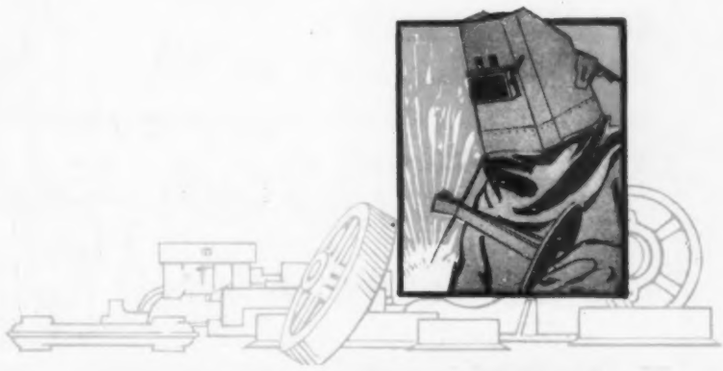
Every Shop Needs the Westinghouse Portable Arc Welder

The Westinghouse Portable Arc Welder is a dividend-producing repair unit. It saves money, time, and labor. Every shop needs it for emergencies. *Remember that the savings on a single emergency often covers the cost of the set.*

Learn all about the money-saving possibilities of arc welding in our new publication—Arc Welding in the Metal Working Industry. Send for your copy.

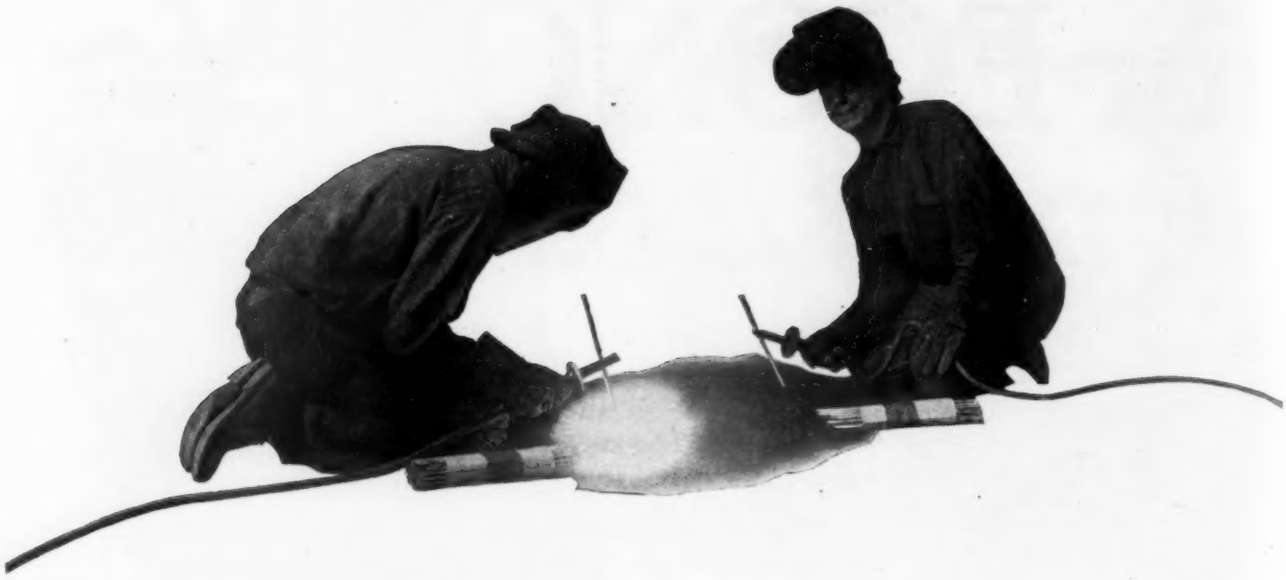
Constant current is absolutely essential to good welding. This chart, taken during actual operation by a user of a Westinghouse Arc Welder, strikingly illustrates this characteristic.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh Pennsylvania
Sales Offices in all Principal Cities of the United States and Foreign Countries



ARC WELDER

X8453I



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Insure your welding jobs being done right the *first time* by always using Wilson "Color-tipt" Welding Wire — the utmost in quality, uniformity and economy.

Always the same—always *uniform!* That's what Wilson Welding Wire is noted for. The welders prefer it because they can depend upon it. They know each rod is like every other rod of the same grade. And there's a grade for every kind of welding—each designated by its color. Hence *"Color-tipt."*

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WELDING MACHINES AND WELDING WIRE

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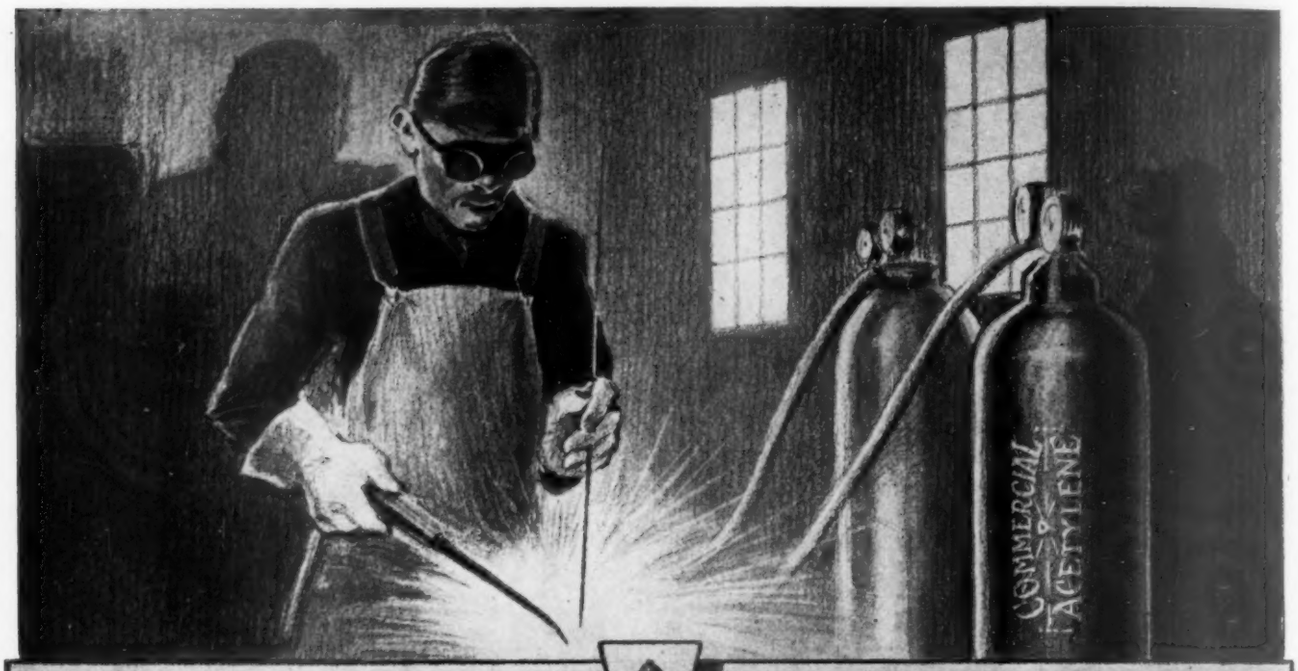
World's Largest Manufacturers of Bourdon Spring Gauges.



The right foundation for good cutting and welding is pure Acetylene

We supply it in:

Carload lots, truckloads or single cylinders.

Whatever your acetylene gas requirements may be let us quote you. Outline your gas consumption and our prices will be promptly furnished.

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—by Welders

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City ..... *State* .....

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Patronize Local Industries. Aid in the support and prosperity of your own community. Get quicker service—with courteous attention. And above all **secure high purity oxygen**—when you need it and as you need it. The 56 plants of the Gas Products Association listed below offer you all of these advantages. Why not accept them?

56 Plants One Is Near You

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Los Angeles—California Compressed Gas Co.
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*Trenton — International Oxygen Co.

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Dayton — Dayton Oxygen & Hydrogen Products Co.
Niles—Ohio Oxygen Co.
Portsmouth — Midwest Oxygen Co.
Toledo — International Oxygen Co.
Wickliffe—Clarke Chemical Co.

*Signifies Warehouses.

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Tulsa—Tulsa Oxygen Co.

OREGON
Portland—Portland Oxygen & Hydrogen Co.

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*Lancaster—Paschall Oxygen Co.
Norristown — Burdett Oxygen Co.
*Philadelphia — Burdett Oxygen Co.
Philadelphia — Paschall Oxygen Co.
Pittsburgh — Burdett Oxygen & Hydrogen Co.
Verona — International Oxygen Co.
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RHODE ISLAND
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STARTING with the mining of the iron ore, the Wickwire Spencer Steel Co., controls every step in the process of manufacturing welding wire.

Among the various grades of Wickwire Spencer Welding Wire there is the right wire for every kind of welding. Some are made to the American Welding Societies' specifications, and others to our own tried and proven specifications.

Write for a descriptive leaflet giving a complete analysis of each grade.

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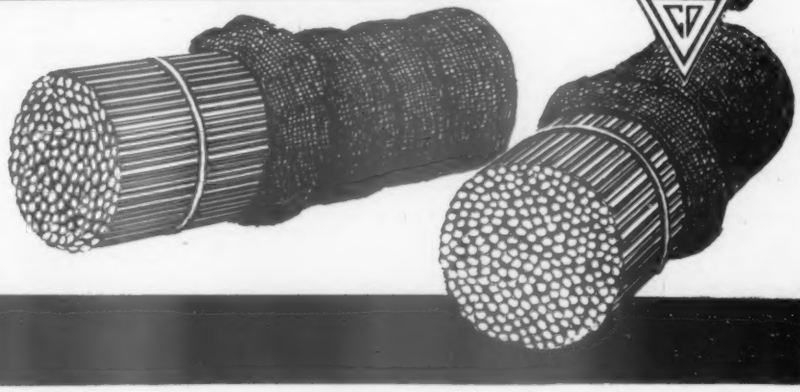

Buyers' Index

Readers of The Welding Engineer will find this index to contain the most accurate information obtainable relating to welding apparatus and supplies. The advertising section includes the principal manufacturers of the United States.

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Commercial Acetylene Supply Co.
International Oxygen Co.
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International Oxygen Co.

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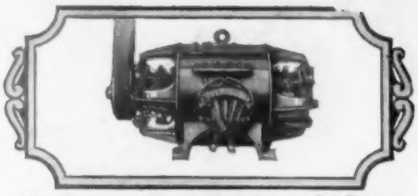

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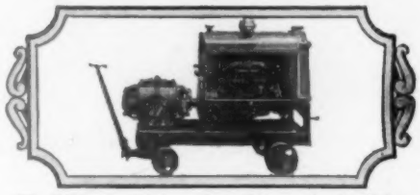

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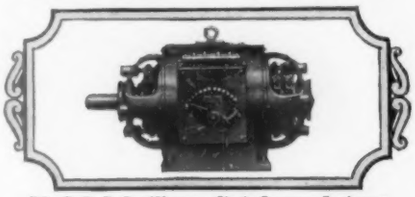

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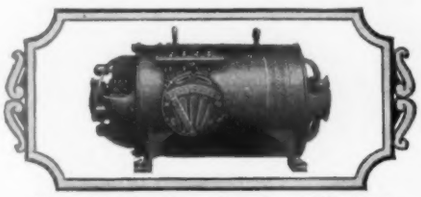

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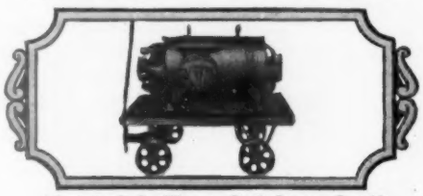

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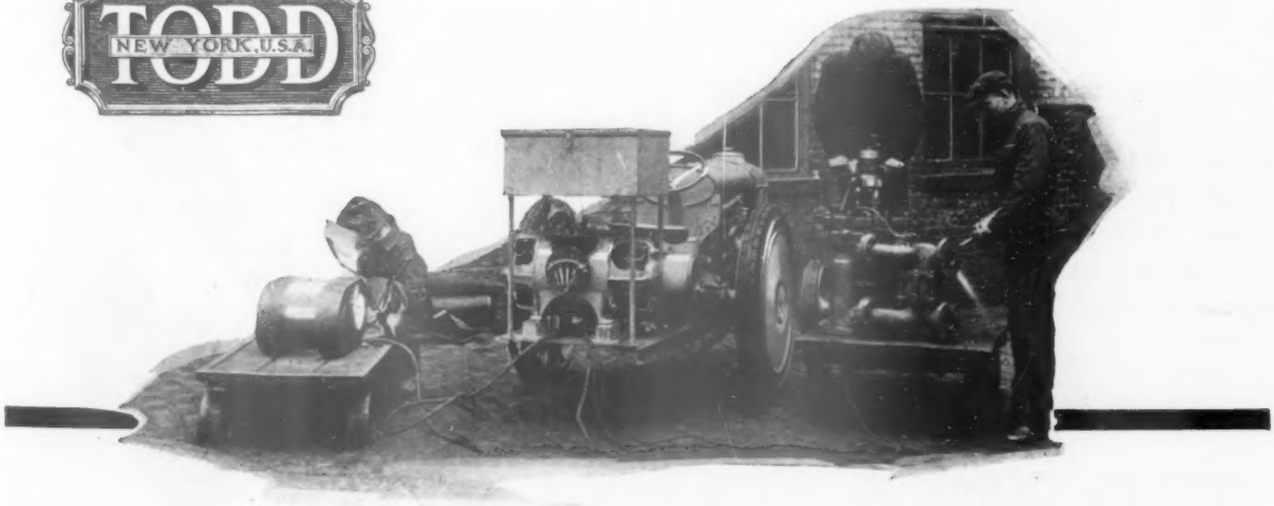

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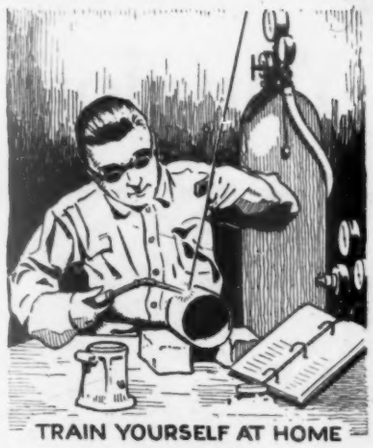

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Welded 8-Inch Steam Pipes Designed to Carry Over Two Hundred Pounds Pressure

By Geo. F. Walker

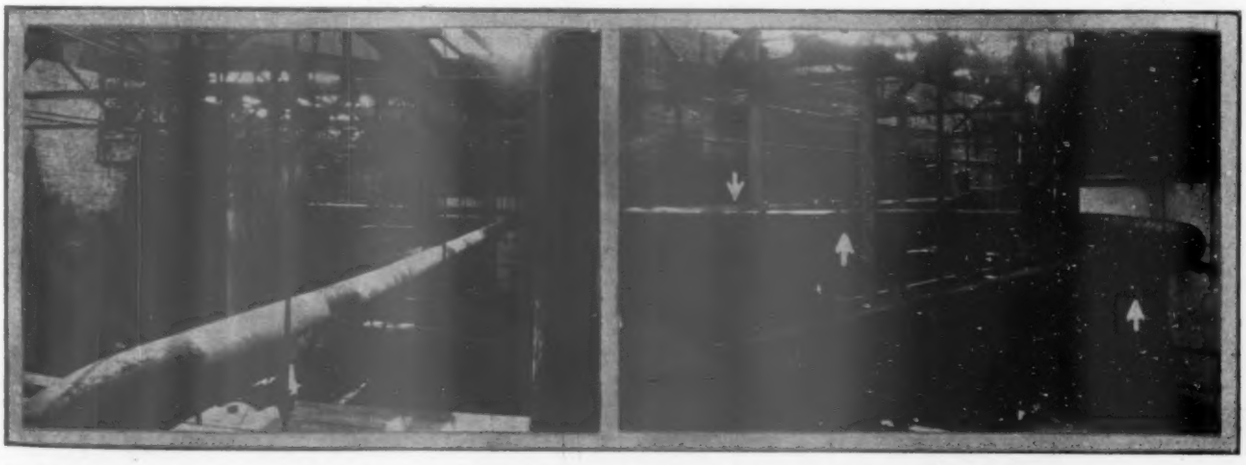
THE utility of the Oxy-acetylene welding process in big power plants is again demonstrated by the photographs which accompany this article. They were taken during the progress of the big pipe job which is now about completed at the plant of the Draper Corporation, Hopedale, Mass., the largest manufacturers of looms and textile machinery in the United States, if not in the world. This plant sends its products all over the world. Only just recently it completed an order for 1500 looms which were shipped to Japan. I have seen shipments going out from this plant to South America, Europe, Australia and parts of Asia. They have been changing the power house of this plant for removing eight old upright boilers and installing two new type boilers of modern design, one a Heine water tube boiler and the other a special built type of Manning boiler with a Dutch oven, constructed so as to gather and burn up waste material such as shavings and chips from the pattern shop, wood shop and carpenter shop which are carried to the boiler through a blower system and fed into the boiler from everhead with a force draft.

The piping contract was let to the Jenison Company of Fitchburg, Mass., and specifications called for a welded job throughout on high pressure lines which are constructed of extra heavy steel pipe. I was sent out on this welding job with a good helper. It consisted of welding 3 in., 4 in., 6 in., 8 in., and 10 in. sizes of pipe, with the 8 in. size prevailing.

There were the usual number of inconvenient places to get at the joints and make welds. These will be found in any steam power job. If some of the engineers who plan out the work had to make some of the welds I believe on their next layout they would make certain changes that would be appreciated by the welder.

In this power house, these main lines are about 65 feet above the floor and most of the welds were made with the pipe in this position, owing to the difficulty of hoisting the pipes into place after welding. The ends of the pipe were bevelled as usual for the welding then the lengths were hoisted into position, lined up and bevelled for the proper pitch, etc. To hold them in place while we got started we used the pipe hangers described on page 21 of the March 1925 issue of *The Welding Engineer*. The clamps are so constructed as to allow tacking on four different places around the pipe. After the tack welds were made the clamps were removed and we were ready to start welding.

Looking Up Through the Power House



Six Length of 8-inch Line, Terminating in S-bend. View of S-bend is Shown at Right, with Arrows Indicating Position of Welds.

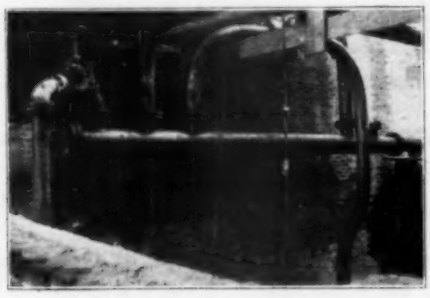
Our standard procedure was to start on the under side or bottom of the joint and work upward toward the top. Then changing over to the other side of the pipe we started again at the original starting point on the under side of the pipe and worked upward toward the top, always finishing the weld at the top of the pipe. Then we applied a large blow torch and heated the welded section and adjacent metal to a cherry red heat and allowed it to cool gradually. This anneals the weld and eliminates to a large degree any stresses that might have been set up during the welding operation.

I used 1/16 and ¼ inch Norway iron pipe in making these welds; mostly the 3/16 inch size, as I found it was easier to handle in the difficult places and positions than the ¼ inch rod.

There are also a great many nozzles to weld in, couplings for return drips, etc., and we had to put in filler pieces here and there where measures came short. Then there were headers to make brackets to be welded and the usual variety of miscellaneous jobs that welders find to do on a pipe installation of this sort.

I stayed on this job until it was tested out and had the happy experience of seeing another job stand up under high pressure without a single leak anywhere in the line which is designed to carry over two hundred pounds pressure.

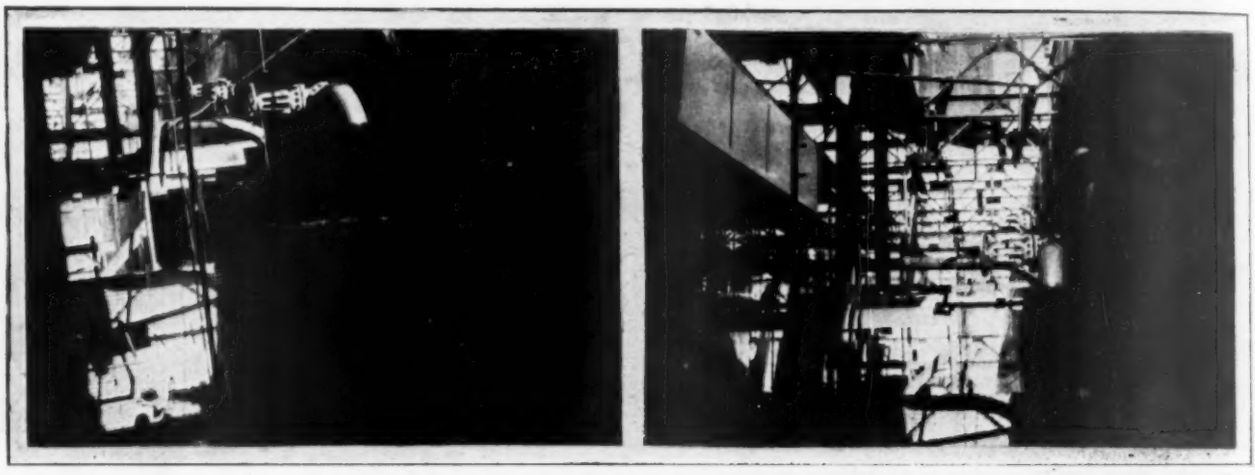
One of the photographs which I took gives a view up through the power house and shows a long line and drop making a total length of about 140 feet. In it there are seven welded joints. Another picture shows a 10x8 inch header with five welded on and bends leading from the header. This header was welded on the floor and hoisted into place by and wall brackets. Note that the drift pipe with a small valve is welded on the under side of the header. This was done after the header was set up.



Header with Five Welded Nozzles

In another view it will be seen that this length of 8 inch line terminated in a long S-bend for expansion. The iron work shown in this picture is the trusses for the roof. At the far end of the picture can be seen the Manning boiler covered with asbestos. In the close up view of the S-bends on which three of the welds are marked by arrows the photographer included the team which did the job.

There are also a cople of views of cross front bends and drops on the side of the power house leading out from the Manning boiler. There are two welds in the top line, one on each side of the valve. Note that the header in the lower part of one of these photos has offset bends dropping down to the fire pump line from the header.



Crossovers, Bends and Drops in Welded Pressure Pipe Installation

There is no question about the value of the welding on such construction as the one described. It also seems that every one of these jobs has problems of a different nature so it isn't easy to lay down any standard rules of procedure. It is necessary, of course, for the operators to be good pipe welders. On top of that they must be familiar with the kind of service these lines have to give and be resourceful in the solution of the working problems which come up unexpectedly.

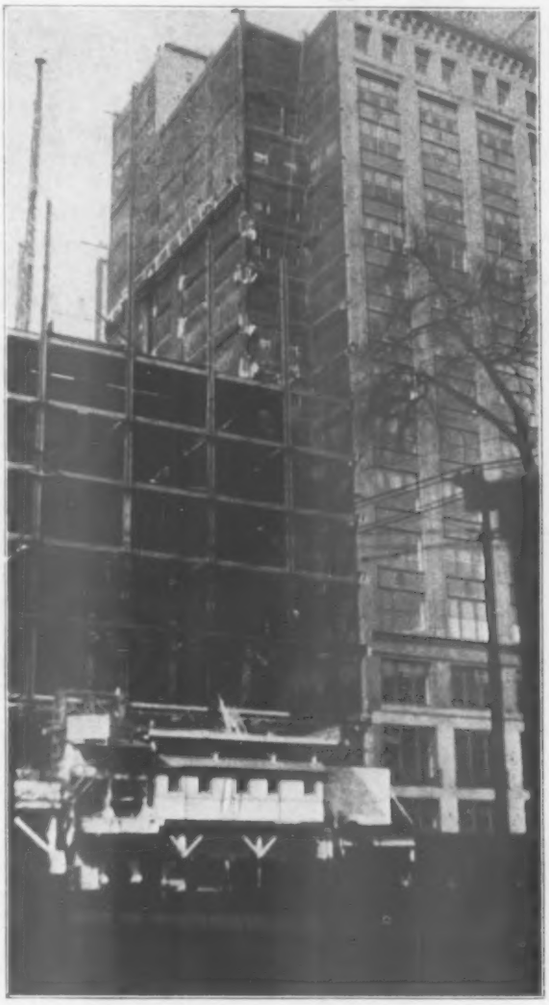
NEW ARC WELDING HANDLE

The Fibre-Metal Products Company of Chester, Pa., has recently perfected and put on the market a new type of electrode holder of which an important feature is the non-conducting fibre handle. This company has for many years been engaged in the manufacture of fibre helmets and face shields for the arc welding trade which has been known under the trade name of "Bowers." The Fibre-Metal Products Company makes a specialty of light manufacturing with particular attention to fibre products.

Arc Welding on Structural Steel

How the Slaymaker Electric Welding Company Has Demonstrated the Value of Welded Steel Construction on New Building Operations in Detroit

IN the city of Detroit welding has had an opportunity to demonstrate its value to the building industry, by solving several construction problems which came up in connection with the erection of some of the city's new buildings. The Slaymaker Electric Welding Company, of Detroit, who planned and executed a number of important jobs of this nature within the past year, has earned an enviable reputation in the Middle West for knowing how to handle the problems involved and for performing quality work. The pioneer work which had to be done in designing and testing typical joints, and in demonstrating to safety engineers that welded joints would stand up under the service required of them involves a mass of detail which will probably not be recorded, but those who have been working along similar lines will easily appreciate what the efforts of the Slaymaker organization mean to the welding industry.

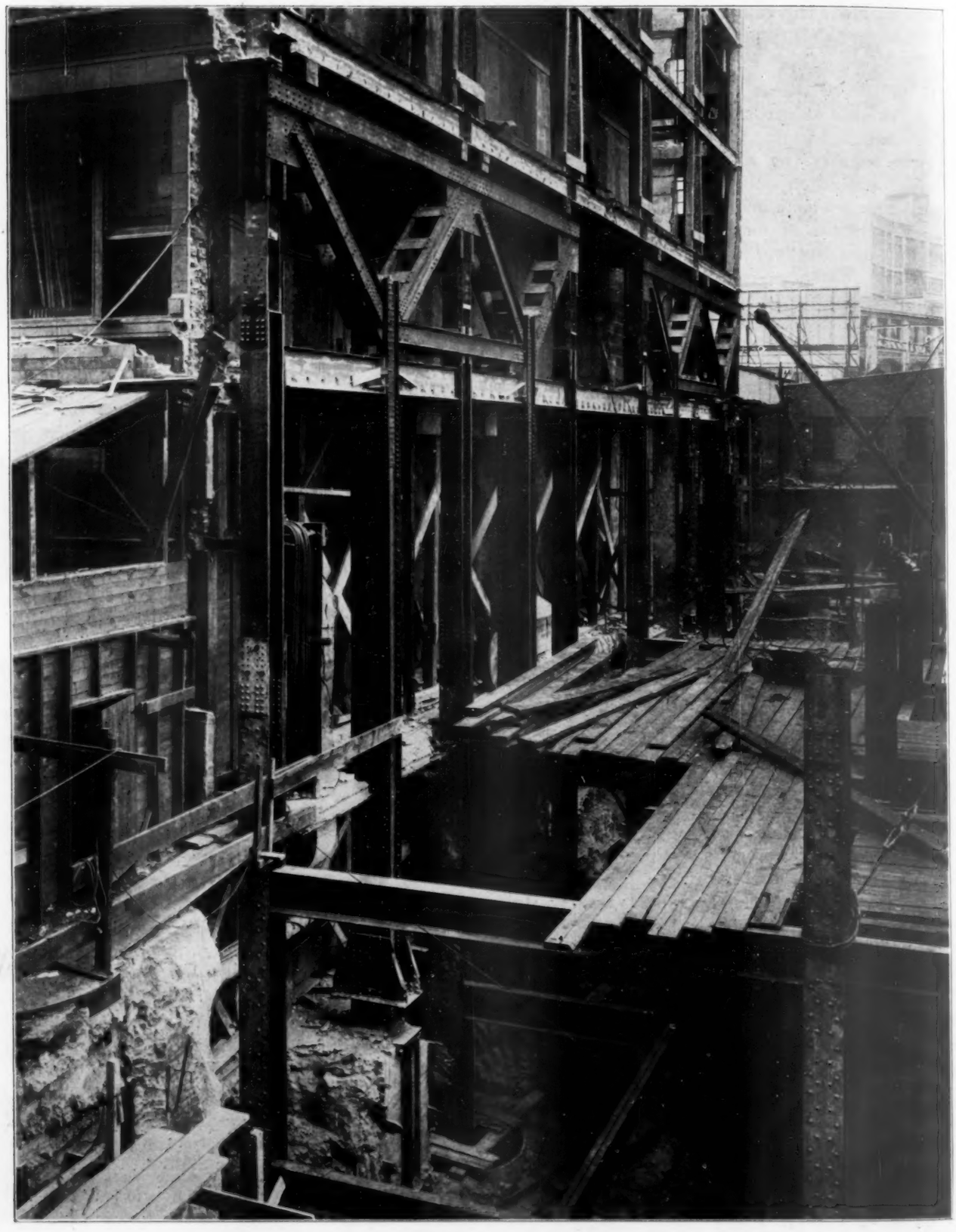


Early Stages of Work on J. L. Hudson Dry Goods Co. Building

It is expected, even by the most optimistic promoters of the welding art, that the progress of welding in the structural steel field will depend upon aggressive effort to assure a steady advance. Every successful job, however, adds to the score in favor of the process, and increases the chances of making a regular place for welding in the specifications of the architect. While we are waiting for the day to come when they will specify welding as a matter of course, we can review a couple of operations on which it was specified as a matter of need. And those who criticize the process may meditate upon the fact that it is beating out the riveting process in the "hard places."

One of the construction jobs recently completed by the Slaymaker organization was in connection with a fifteen-story addition to the building of the J. L. Hudson Company Dry Goods Store. These merchants were in a hurry for the new building to be completed because they needed the additional floor space to take care of increased business. The possibility of a temporary reduction in the floor space they already had was very undesirable under the circumstances, and to have used riveted construction throughout the new building would have meant this very thing, for it would have been necessary to tear out some of the old walls in order to get working space for the riveters. This would have meant an additional disadvantage of much noise and dirt in the salesrooms, which would not only ruin some of the stock, but also be very disagreeable to the customers. Since the owners of the store felt that they could not spare an inch of their floor space, they welcomed the suggestion of welded construction, which would allow the work to go on without disturbance to the operations of the store. Mr. Slaymaker demonstrated to the builders and to the local building inspectors that the type of work he proposed to do was perfectly safe, and the work was done with a degree of success that has paved the way for more work of the same nature.

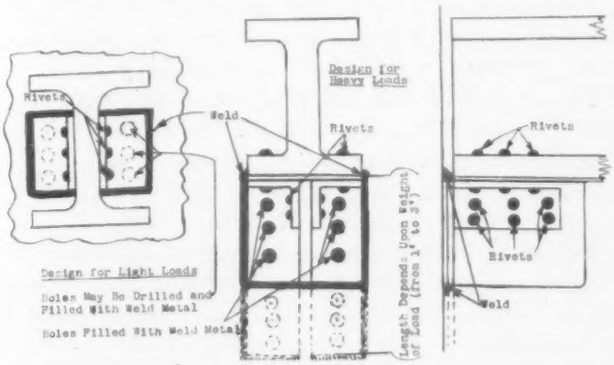
The actual welding done on the Hudson job consisted in welding the I-beams to the supporting girders on the side joining the old and new buildings. As indicated in the accompanying sketch, a heavy angle was used for making the joint for light loads, the angle being riveted to the I-beam and welded to the girder. For heavier loads a bracket was welded underneath the beam. In the case of very heavy loads this bracket was three feet long and for medium loads only one foot. When the new building settles the beam can slightly tip and still no more strain is placed on the welded bracket. In the case of some of the joints holes were drilled in the faces of the angles which were laid against the girders, and these holes were filled in by the welder. "Some work of this same kind has been done without the use of the angle iron," says Mr. R. K. Slaymaker, "and an extra amount of electrode material deposited for safety. But I am convinced that this type of joint is the one that should be used. We know it will hold, and we want all of our building jobs to hold until enough of this work has been done successfully to demonstrate



General View of the Work on the Crowley & Milner Building, Detroit. This Job is a Good Indication that Welding is a Dependable Process for Joining Structural Steel Members. The Building Industry Has Scarcely Begun to Realize the Possibilities Ahead of the Process

that welding is all right when done by someone who knows how. You can't get additional strength just by putting down more weld metal, and if you are going to deposit it you might as well deposit it where it will do the most good." There is good judgment in this thought, and it is known that many people who have not studied welding will judge the strength of a welded job by the amount of metal they see over the joint.

Another interesting job consisted in taking out the supporting members from one side of the Crowley & Milner building in Detroit and replacing them with heavier and stronger sections, when a new building was being erected alongside it. A series of photo-



Detail of Designs Used in Attaching "I" Beams to Supporting Girder

graphs were taken to tell the story of the construction and show how welded joints were used to carry the weight of the building while the work of reconstruction was in progress. Twenty-four 4-inch angles, each five feet long, were used on this job, and the photographs show how they were called upon to hold the entire weight on this side. Mr. Slaymaker tells how the welds held when called on for more than extra duty. "In the case of one of the columns," he says, "it was found necessary to use jacks to raise the build-

Structure Used to Support Crowley & Milner Building During Alterations

ing, in order to get the old column out. As they planned to raise it only a sixteenth of an inch, I was sure that the welds were good for the test. But someone made a miscalculation and the building was actually raised about five times that amount. It was a good deal more than we expected, but after it was over there was no sign of distress in any of the welds we had made."

A job similar to that on the Hudson Dry Goods Store was performed when an addition was built for the store of the Peoples Outfitting Company, of Detroit. This was a twelve-story building, and required the welding of ninety-one I-beams. One man could average three or four of these a day, at a cost of about ten dollars each, as against an estimated cost of forty dollars each for riveting, with the added advantage of carrying on the work without interrupting the store's regular use of the floor space in the old building. Another example of advantages welding may have in addition to savings in operating costs.

In cities where ground values are so high that new buildings are built right up against older ones in order to get the use of every square inch of real estate, the sort of work which Mr. Slaymaker has shown can be done successfully may expect to develop quite an ex-

Close-up of Welded Angles on Crowley & Milner Building

tensive field. But the jobs just described also stimulate visions of acceptance for welding on large structural steel projects, and on a scale which has for many years appeared to wait on some far distant date.

Right now what is thought to be the first two-story steel building to be erected entirely by welding, and by a firm of commercial welders, is under construction, and complete details of the jobs will shortly be released for publication. It is thought that the possibilities in this direction will be more fully realized and more extensively developed when one good example is furnished, and that the use of welding for construction purposes is on the threshold of a rapid growth.

WILL TEACH WELDING BY CORRESPONDENCE

Men in the oxy-acetylene welding industry who have been interested in the possibility of teaching welding by correspondence are watching with interest the work of the Kerr Welding School, which was established late this summer in Los Angeles, California. The directors of the school have worked out a complete course of instruction for those who wish to study the oxy-acetylene process at home. The instruction sheets cover steel, cast iron, malleable iron, aluminum, brass, bronze and copper oxy-acetylene cutting and brazing. Instructions in the fundamental principles of welding these metals are supplemented by instructions in various types of welding jobs, such as pipe welding, sheet metal welding, shafts, wheels, automobile jobs, etc.

Torch Hints for Railroad Welders

Oxygen Lance Principle Can Be Applied to Removal of Main Pins—Gaskets Made by Brazing Copper Rings—Carbon Burning on Valve Spools—Brazing Mud Rings

By R. P. Palmer

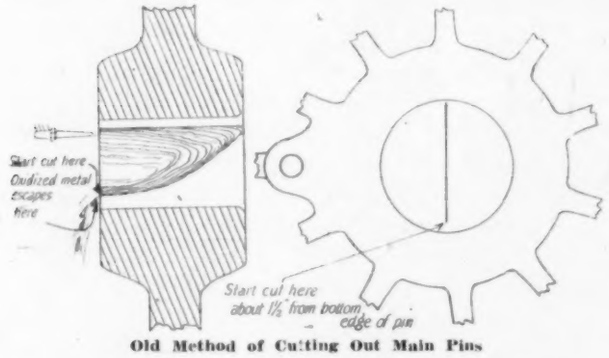
WORKING with the idea that two heads are better than one I decided to get the methods of several different railroad welding shops for doing various jobs, mix the ideas together and see what would happen.

I applied for permission to visit the repair shop of one of the leading railroads with visions of many new ideas. After getting permission I was taken to the welding shop and introduced to the welding foreman. I was surely in luck because everything was working smoothly that day and the foreman had plenty of time to visit with me.

Cutting Main Pins

He said, "We are going to cut a main pin out of a locomotive wheel and I believe it might interest you," so we went to Pit Number Three, where the work was just being started.

The first operation was cutting a hole through the center of the pin. This was done with a piece of ¼-inch pipe and oxygen. I was familiar with this method of cutting, but I did not see why the hole could not be cut with the cutting torch and eliminate the extra hose and pipe. I immediately asked Bill (the foreman's name was Bill) why he used the pipe.



Old Method of Cutting Out Main Pins

He explained that on account of this pin being one of the largest in use that it was quite a job to cut the first hole through the pin without spoiling several tips and wasting a lot of oxygen, by using the cutting torch. But with the pipe the operation is complete in such a short time that they save about one hundred cubic feet of oxygen and at least one tip. Just then the cutter turned on a little oxygen in the pipe and heated the end of the pipe with the cutting torch. The end of the pipe began to burn like a Fourth of July sparkler. He shut the torch off, picked up the pipe and placed it against the center of the pin, which had been previously cut flush with the wheel. Bill stationed himself at the oxygen valve, and in about one second the sparks started from the pin. Bill gave her the gas and that cutter literally pushed the pipe through the pin.

I intended to time the operation, but I guess I must be very slow because I just got my watch out when the spark showed up on the other end of the pin.

After getting a hole through the pin the cutting torch was used to cut it in two pieces and remove it.

Bill explained the old method of removing pins which is shown in sketches No. 1 and 2. Bill told me this old method was used on the Ark so I did not tell him that we were using the old method.

Copper Gaskets Made to Order

Bill and I started walking through the shops when a coppersmith stopped us and told Bill he had some copper gaskets he wanted brazed as soon as possible. Bill said, "Fine. I was just wishing I could show this gentleman our new method of brazing these gaskets."

We went to the welding shop to do the work. The gaskets were made of ⅜-inch round copper and bent into a ring about 2½ inches in diameter. They were made from a straight copper rod and the coppersmith wished to get the two ends joined, thus making a solid ring.

Bill placed a piece of steel about 4 inches square on the welding table and placed the two ends of the ring upon this piece of steel. He separated the ends about ⅜ of an inch. The welder applied the torch to the ends. Both ends were soon red hot. The welder next applied a little flux to both ends. The flux immediately became liquid and a little Tobin Bronze was added to each end. The ends were separated just enough that both could be heated at the same time. Bill said, "Now watch very closely. You see the bronze on the ends of the rods is liquid so we will put them together." He pressed them together and it resembled an electric butt weld. There was just a little excess metal around what used to be the ends.

The coppersmith said he did very little filing on that job; but by the old method, using a small Vee, he had to do a lot of filing. Bill said they brazed all sizes in the same manner, some with rods as small as ⅛ inch, and all are 100 per cent perfect.

A Use for Carbon Burning

When we were going into the welding shop, I noticed a man just outside the shop who was placing a locomotive valve spool on a small brick base so I asked Bill what he was doing. Bill said, "Come outside and I'll explain."

My first thought was that the valve spool was broken and was being preheated before welding, but I soon found I was wrong. Bill showed me the thick deposit of carbon on the spool which was the same as

on all spools when removed from the locomotive. Bill explained that they were ging to do some carbon burning.

The spool was placed on a brick base about 8 inches high and of the same diameter as the spool. An oil burner which was bent so that the flame shot straight up and through the spool was used. The burner being in the bottom of the base, this caused the carbon to burn and fall off. The spool was almost red hot and the carbon on the outside of the spool burned a little, changed from black to grey color, and dropped off. Care must be taken not to lay the spool down while hot as it will warp, but Bill said there was no danger if the spool was placed on a level surface.

They have been burning about thirty spools per month for two years and not a complaint because of warping. The time for burning one spool is about twenty minutes and quite often one spool is placed on top of another and both burned at the same time. After the spool has cooled, a wire brush is used for cleaning. Two spools can be cleaned in thirty minutes. By the old method of removing the carbon with scraper and chisel one helper could clean two spools in eight hours.

Bill said, "This job is not exactly a welder's job, but we discovered this method when we were preheating a spool to weld, so the job was wished onto us."

Building Up Mud Rings With Bronze

We next went to the boiler shop where a welder was building up a mud ring. This ring was badly deteriorated on the water side due to the action of certain elements in the water, but Bill assured me that they would never have any more trouble with this ring and when we got into the fire box I began to understand what he meant. I supposed the work of building up this ring was being done by electric, but I was wrong because they were using oxy-acetylene and building the ring up with bronze, the water and its elements having little or no effect on the bronze. Bill gave the credit for this job to a service welder that visits their shop occasionally.

We next went to the round house to see a welder building up a worn flange on a driver's tire. This happened to be on a passenger engine and the wheel was 72 inches in diameter, giving the welder almost nineteen feet of welding. Bill was doing this job just a little different than the ordinary because he was working a helper with a welding torch to heat the flange ahead of the welder.

I asked Bill if that operation wasn't rather expensive on account of the extra man and torch, but he replied that he was saving money by this method. He immediately produced a piece of chalk and started figuring like this: Cost of gas and oxygen by old method, $22.41. Cost of labor, old method, $6.24. Total, $28.71. By the new method you can get the engine in service three and one-half hours sooner, get a much better job and the cost for gas and oxygen is $19.95, and the labor, counting the helper, is $4.73; total, $24.68; a saving of $4.03.

CAUTION IN USING COMPRESSED GAS CYLINDERS

The Interstate Commerce Commission has prescribed certain regulations pertaining to the shipment of dangerous articles by rail. These regulations include specifications for the manufacture and testing of cylinders used in transporting gases compressed to pressures over 25 pounds per square inch. The Regulations prescribe certain cylinder test requirements which must be complied with before the cylinders are acceptable in interstate of intrastate commerce by freight or express. Tests are considered necessary in order to reduce to a minimum the hazard of having in circulation cylinders which are not in proper condition to withstand the service for which they are intended.

The gases which are commonly shipped in these cylinders, and the intervals at which the cylinders must be tested are as follows:

Name of Gas	Intervals at which cylinder should be tested
Acetylene	Once—before putting in service
Anhydrous Ammonia	Every 10 years
Carbonic Gas	Every 5 years
Chlorine	Every 5 years
Ethylene	Every 5 years
Helium	Every 5 years
Hydrogen	Every 5 years
Hydrocarbon Gases (other than Acetylene)	Every 5 years
Methyl Chloride	Every 5 years
Nitrous Oxide	Every 5 years
Oxygen	Every 5 years
Sulphur Dioxide	Every 5 years

Non-liquefied gases with pressures not over 300 pounds. Once

When cylinders have been tested, the date, that is, the month and year in which the test was made, must be stamped into the metal of the cylinder near the top, i. e., a cylinder tested in March, 1925 would bear the markings "3-25".

In order to safeguard the interests of all concerned with cylinders charged with compressed gases, those who use the cylinders should observe the markings showing the dates on which the containers were tested. If at any time cylinders are found which are over-due for test the owner of those cylinders should be promptly notified that the containers are not tested and marked in compliance with the regulation prescribed by the Interstate Commecre Commission.

In order to insure the greatest safety cylinders charged with compressed gases should at all times be containers which have been tested in compliance with prescribed regulations. The use of cylinders which have not been so tested, whether in transportation or in service, is unwarranted, and all those dealing with compressed gases should be actively interested in preventing the use of gas cylinders which are not tested as prescribed by the Interstate Commerce Commission.

U. S. GAUGE CO. DOES NOT MAKE REGULATORS

R. E. Bruckner, sales engineer, U. S. Gauge Company, New York City, writes:

"It has been reported to us that a salesman connected with one of the apparatus manufacturing companies, is offering for sale a cheap regulator equipped with U. S. Gauges, and that when requested to name the manufacturer of the apparatus, points to the trade-mark on the gauge and states that the whole device is put out by the United States Gauge Company.

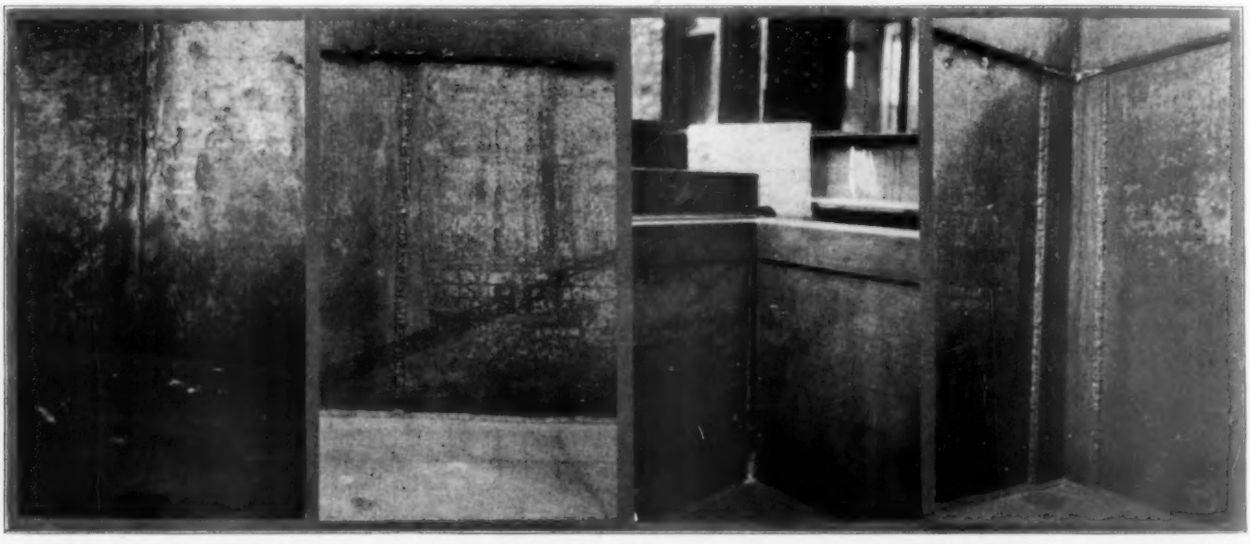
"Will you be good enough to publish in your next issue the following statement, or publish this entire letter:

"The United States Gauge Company manufactures gauges. It has never put out a regulating valve, is not now making one and does not contemplate entering the field of apparatus other than gauges."

Building an All Welded Swimming Pool

A Specialist in Tank Construction Has No Trouble Building an All Welded Pool Which Meets All Requirements for Strength and Tightness

LAST month *The Welding Engineer* published a story of a riveted and welded swimming pool which has just been completed for one of the new club buildings in the Loop district of Chicago. While data was being collected for that story, attention was called to an all welded swimming pool in the new building of the Standard Club, on Plymouth Court, near Jackson Boulevard, and through the courtesy of the Graver Corporation, East Chicago, Indiana, complete data and photographs of this interesting job are made available to those who want to know just how such construction is handled. The Graver Corporation is nationally known for its activities in the construction of all manner and sizes of tanks, and many men in the welding industry are familiar with the huge volume of welding which is daily practice in their East Chicago plant. They are so familiar with the class of work that the undertaking presented no particular problems. When the contract was secured the engineers of the plant knew just how to go ahead and lay out the work. The tank is not quite completed, but so far the work has gone steadily forward on the original plan without any interruptions or trouble.



Left—Side Seam Ready to Weld. Left Center—Welded Side Seam, Top Seam, Bottom Seam and Bottom Corner Seam. Right Center—Corner Seam Before Welding. Right—Corner Seam Showing Angle Iron Welded in Place

"We watch two things right at the beginning of this kind of a job," states Mr. Winslow, Publicity Manager of the Graver Corporation, "One is that we get the correct design and suitable materials to work on, and the other is to get good operators. A lot of our work is so big that it is practically impossible to keep our operators under constant supervision, so we have to select trustworthy welders and let them assume some of the responsibility for the quality of the finished work. Our plans seem to work very well because the demand for our welded tanks is growing every day. We have built so many welded tanks for oil storage that we knew before we started on this swimming pool that it would be just a matter of routine to produce just what they wanted. However, you will note from our instructions on the work that ample precautions for strength and tightness are taken to give us a large factor of safety."

This pool is sixty feet long by thirty feet wide, with the bottom sloping upward from the deepest point toward each end. The steel shell rests directly upon I-beams which are laid lengthwise of the tank. One of the detail photographs shows how this construction appears from the outside. An examination of the drawings and reference to the photographs will show that the bottom plates extend well beyond the side and end plates all around the tank. Channel irons are welded to the bottom plates and tack welding to the side plates on the outside to give rigidity.

Floor plates were so laid as to eave a 3/8-in. gap running directly along the center of the eight-inch I-beams. Welding was started at the bottom, of course, and when completed it made the floor plates one piece with the supporting beam. All longitudinal seams in the floor were made in this manner. The intermediate I-beams were tack welded to the floor plates (this operation is often erroneously referred to as "spot welding", a term which is more properly applied to electric resistance welding) the tacks being 1½ in. long, spaced on twelve inch centers and stag-

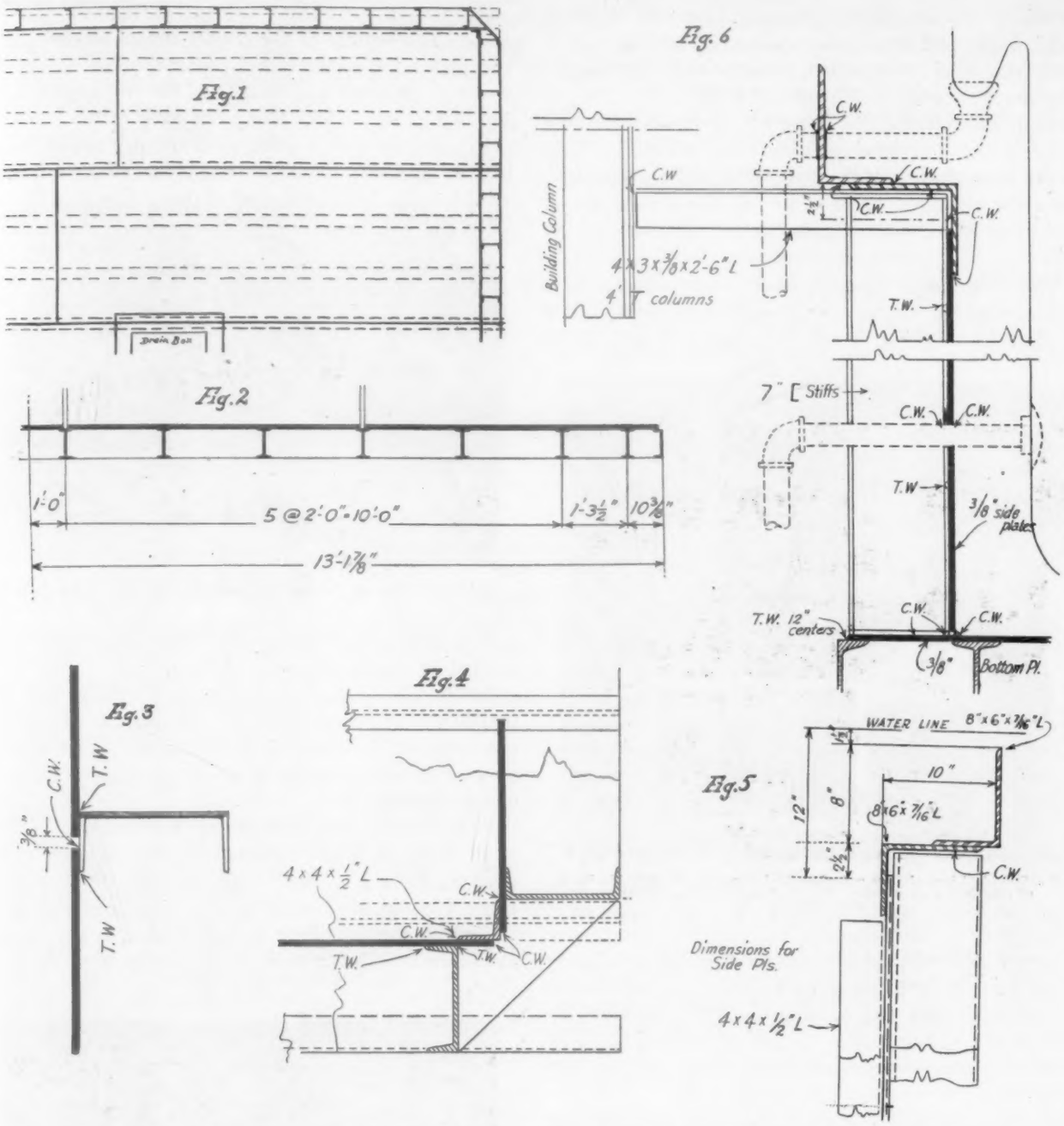
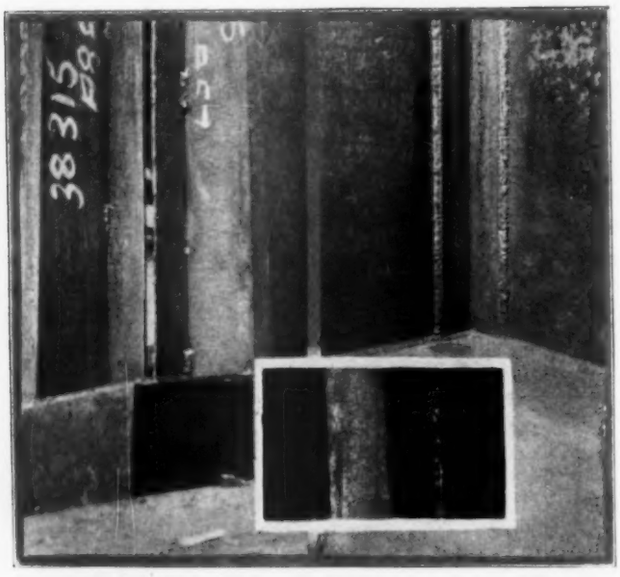


Fig. 1—Plan View of Tank Bottom. Fig. 2—Detail of Joints Between Floor Plates and I-Beams. Fig. 3—Detail of Joints Between Side Plates and Stiffener Channels. Fig. 4—Detail of Corner. Fig. 5—Detail of Top and Rim Angles. Fig. 6—Scum Trough, Drain and Supply Inlet Pipe.

Workmen Clamping Bottom Plates to "T" Beams for Tacking, and a View of the Welding in Progress on Floor of Tank

gered to opposite side of flange. This was all overhead work, and was done while the building was in early stages of construction, a factor which would put any except experienced overhead welders at a tremendous disadvantage. But those who have been through it know that overhead welding often means hanging to the nearest support by your teeth while you manipulate the electrode so as to get all the speed, fusion, and penetration, called for in the specifications of the job.

The traverse joints were 3/8 in. wide, welded from above, working down, over copper strips held solidly in place by blocking up from the lower flanges of the



Left—Outside View of Corner Before Welding. Insert—Outside View of Finished Corner Seam. Right—Inside View of Finished Corner Seam

I-beams. One of the photographs shows how a heavy plank was made to serve as a clamp by having two men stand on one end, holding the floor plates solidly against the beams. The copper plate and blocking were of course removed as soon as the welding was completed.

The side and end wall plates were jointed together on the stiffener channels and welded continuously from the inside of the tank to the channels and to each other. As in the case of the floor seams the joints were prepared by spacing the plates 3/8 in. apart. All the stiffener channels were tack welded to the wall plates from the outside. The tacks were two inches long, twelve inches apart, and staggered to opposite edges of the stiffener flange. Detail photographs show the outside tacking, the inside seam prepared for welding with the wall plates tacked in place, and the completed inside seam.

The bottom edges of the wall plates were welded continuously to the floor plates both inside and outside of the tank. The bottom of the channel stiffeners were welded to the floor plates all around the channel.

At the corners of the tank the wall plates were connected together by angles, and the wall plates were welded to these corner angles continuously on two lines. The bottom of the corner angles was welded to the plates both inside and outside. The top of the channel stiffeners was welded to the rim angles at the top of the wall plates along the back of the channels.

Rim angles were welded continuously to each other in two lines and the lower angle had two continuous welds to the top of the wall plates. The angles were mitred at the corners, as shown in detail photographs,

Welding Equipment Located on Main Floor Furnished the Current

and welded. The struts opposite the columns were welded to rim angles and columns.

Instructions called for scraping all plates and materials clean before welding. All plates, angles and channels which were not delivered the exact size indicated on the drawing were cut on the job with an oxy-acetylene cutting torch.

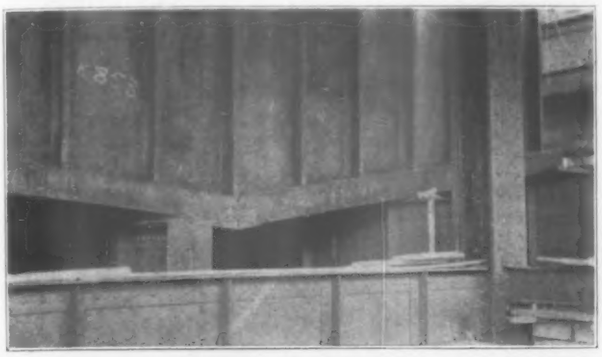
The material used in this construction was 7/16-in. tank plate. A 5/32-in. coated Weldite electrode was used as filler material. Current was supplied from three Lincoln gasoline driven welding generators installed on the first floor and grounded to the smokestack, the tank being built at the south end of the sixth floor.

View of Inside of Tank While Work Was in Progress

As for the quality of the work, the Graver Corporation is required by the contract to guarantee the water tightness of the welding. After all welding is complete the tank is to be filled with water and kept filled for a period of eight weeks, after which the water is to be drained out and the tank cleaned.

The architects in charge of the erection of this new Standard Club building are the firm of Albert Kahn,

Inc., of Detroit, Mich. Their representative in Chicago, having immediate supervision on the work, is Mr. Fischer. Detroit builders are probably giving more attention to the possibilities for welding in construction work than is true of other cities, on account of the successful applications which have been made there on new buildings within the past year. Chicago,



Outside View of Tank Showing Supports for Sides and Tank Supports

however, is looking forward to the building of several new club buildings, and with the start she has, ought to lead the world in welded swimming pools. It has been reported that two swimming tanks are included in the plans of a new athletic club building which is to be built on the South Side, near the Midway. Will they be welded? They ought to be.

FALL MEETING OF THE A. W. S. INCLUDES EXHIBITS

The Annual Fall Meeting of the American Welding Society will be held October 21st, 22nd, and 23rd, at the Massachusetts Institute of Technology, Boston, Mass. In addition to the program of technical sessions and entertainment, arrangements have been made for manufacturers to exhibit and demonstrate all kinds of welding apparatus daily at the Institute. A number of manufacturers have arranged for exhibit space and promised to have operators available who will contribute to make the exhibition of equipment unusually interesting.

Publications of The Welding Engineer Publishing Company will be exhibited in a booth in charge of T. E. DePew, Eastern Representative of *The Welding Engineer*, who will be assisted by R. K. Randall, Welding Instructor, Cleveland School of Technology, also Arthur Lavan, C. M. Sandell and S. Steedman.

Arrangements have been made for a generous amount of entertainment, including visits to the many points of historic interest in Boston. Visiting ladies will be able to make these sight seeing trips without charge. Convenient lunch arrangements have also been made with the lunch room of the Massachusetts Institute of Technology. Banquet night is Thursday evening and the dinner will be held at the Hotel Somerset. Major Curley of Boston, Dr. S. W. Stratton, President of the Massachusetts Institute of Technology, Prof. C. A. Adams of Harvard, Elihu Thomson of the General Electric Company, and Prof. A. S. Kinsey of the Stevens Institute of Technology are included in the speakers list. This dinner will be followed immediately by a theatre party to see The Student Prince at the Shubert Theatre. Arrangements have been made to take the members to the theatre by motor buses immediately after the dinner. The entertainment committee calls attention to the sight-seeing trips, the banquet and the theatre party all open to the visiting ladies wihout charge.

The program of the fall meeting is as follows:

WEDNESDAY, OCTOBER 21, 1925

Morning—Room 5-330

10 a. m. to 12 m.—"Thermit Welding," J. H. Deppeler, Chief Engineer, Metal and Thermit Corporation.

Afternoon—Room 5-330

2 p. m. to 4 p. m.—"Gas Welding of Power Plant Piping," A. W. Moulder, Chief Engineer of the Grinnell Company.

Evening

8:30 p. m.—Special exhibition and demonstration of welding and cutting applications.

THURSDAY, OCTOBER 22, 1925

Morning—Room 3-270

10 a. m. to 12 m.—"Industrial Applications of Arc Welding and Economics Effected Through Its Use." Joint paper by H. M. Hobart, Chairman, Electric Arc Welding Committee, and W. Spraragen, Secretary.

Afternoon—Room 5-330

2 p. m. to 4 p. m.—Meeting of American Bureau of Welding. (Research Department of Society). Program will include review of present activities and outline of future investigations.

4 p. m.—Meeting of Board of Directors of the American Welding Society.

Evening

5:30 to 8 p. m.—Dinner party.

8 p. m.—Theatre party. For details see page 3.

FRIDAY, OCTOBER 23, 1925

Morning—Room 5-330

10 a. m. to 12 m.—"Selection of Materials for Welding." A series of short addresses by several prominent experts on this subject.

Afternoon—Room 3-370

2 p. m. to 4 p. m.—"Manufacture of All Steel Automobile Bodies" (illustrated by moving pictures). J. W. Meadowcroft, General Supervisor of Welding, E. G. Budd Manufacturing Company.

INTERNATIONAL ACETYLENE ASSOCIATION ALL SET FOR CONVENTION

Preparations have all been made for the annual convention of the International Acetylene Association which will be held this year at the Congress Hotel, Chicago, November 18th to 20th inclusive. The program will include a number of papers which discuss important phases of the development of the oxy-acetylene welding process and its applications in different industries as well as subjects of general interest to manufacturers of carbyde, acetylene and oxygen and the equipment for using them for both welding and lighting. The manufacturers who make up the membership of this association are continuously busy in their cooperation with insurance and safety bodies to make the use of the products of this industry as free from hazard as possible and to discourage practices which would tend to throw suspicion of danger over their use. At the same time, it is necessary to keep up a vigorous campaign against ill advised legislation which is founded upon misunderstanding of the real causes of occasional accidents. This work is necessary to keep the way open for the widening of the field for application of the oxy-acetylene welding process, which is becoming the program of major importance in the activities of the association. Information already received concerning the program suggests that it will lay the foundation for further development work by outlining a systematic method of standardizing important welding operations.

The preparation of the program looks toward accomplishing some real constructive work which will make possible increased progress during the coming year. Still there will be no lack of entertainment. One afternoon will be devoted to an inspection trip of some sort, one of the evenings to a theatre party and the convention will close with a banquet held at the Congress Hotel.

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Los Angeles, Calif.	A. W. Courtney	441 Doug'as Bldg..
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The Bastian-Blessing Co.

246 East Ontario Street : : Chicago, Illinois

Torch Makers Adopt Standards

Aggressive Association Work Has Led to Simplified Practice in the Manufacture of Oxy-Acetylene Welding and Cutting Apparatus

LEADING manufacturers of oxy-acetylene welding and cutting torches and pressure regulators have been working for many months on the problem of standards which could be adopted by all of them which would result in making it easier for users of the apparatus to use different makes interchangeably in some places without confusion and without having to spend a lot of time and money providing adapters.

The first step toward standardization in the industry is the working out and adopting of standard hose connections. Committees of the Gas Products Association and the International Acetylene Association working in co-operation with engineers and their other representatives of apparatus manufacturers finally developed a standard thread and a standard design of nut and nipple which were adopted last Fall by these two associations. It is expected that the approval of other engineering bodies and of government departments will also be forthcoming.

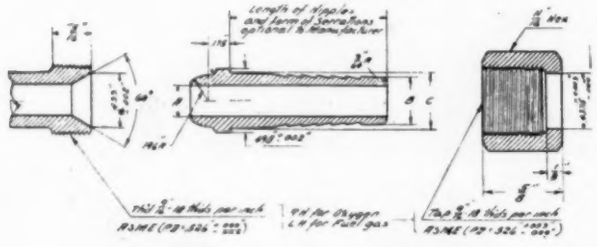

Fig. 1—Design for large size connections

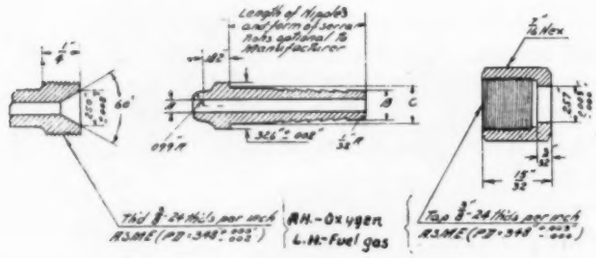

Fig. 2—Design for small size connections

Hose	A.	B.	C.
⅜ in.	.250 in. +.003 in. −.000 in.	.375 in.	.430 in. +.000 in. −.005 in.
⅛ in.	.187 in. +.002 in. −.000 in.	.3125 in	.375 in. +.000 in. −.005 in.
¼ in.	.125 in. +.002 in. −.000 in.	.250 in.	.312 in. +.000 in. −.005 in.
3/32 in.	.093 in. +.001 in. −.000 in.	.187 in.	.250 in. +.000 in. −.005 in.
⅛ in.	.062 in. +.001 in. −.000 in.	.125 in.	.187 in. +.000 in. −.005 in.

Hose	A.	B.	C.
3/32 in.	.093 in. +.001 in. −.000 in.	.187 in.	.248 in. +.000 in. −.005 in.
⅛ in.	.062 in. +.001 in. −.000 in.	.125 in.	.187 in. +.000 in. −.005 in.

These standards were described and illustrated in the December 1924 issue of *The Welding Engineer* and the designs for the large and small connections are reproduced again here for convenient reference.

Following the approval of these standards by the two associations mentioned a vigorous campaign was started to adopt standards by manufacturers. This movement has been very succesful and has resulted in the agreement to accept these standards and make them effective on or before January 1st, 1926 by the following companies:

Air Reduction Sales Company, New York City.
Bastian-Blessing Co., Chicago, Ill.
Harris Calorific Company, Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
The Alexander Milburn Co., Baltimore, Md.
Modern Engineering Co., St. Louis, Mo.
Oxweld Acetylene Co., Newark, N. J.
Purox Company, Denver, Colo.
Smith's Inventions, Inc., Minneapolis, Minn.
Torchweld Equipment Co., Chicago, Ill.
U. S. Welding Co., Minneapolis, Minn.

Throughout the industry it is felt that the adoption of these standards is going to bring so much relief from the confusion which has previously existed as to be heartily welcomed by all users of oxy-acetylene apparatus. For this reason the manufacturers listed above are negotiating with other equipment manufacturers to accept these standards so that if possible they can be made universal in the oxy-acetylene apparatus industry.

It was suggested during a meeting of the apparatus group of the Gas Products Association that the association should prepare a standard tag which could be attached to the torches sent out by the various manufacturers calling attention to the fact that the manufacturer was furnishing the new standard connection. Accordingly, suggestion for such a tag has been prepared and submitted to the manufacturers for approval.

It is hoped that the work of standardization will soon be enlarged to include standards on cylinder valves and cylinder connections. The compressed Gas Manufacturers Association has a committee working on this subject to see if it will not be possible to arrange a standard for all classes of cylinders using fuel, gas and oxygen for welding and cutting. In fact, this is a very lively subject at the present time and it is expected that the Compressed Gas Manufacturers Association will be able to announce a standard within a year's time.

Arc Welding Successful on Drill Stems

Stem Welded More Than Twelve Months Ago Is Still Doing Daily Duty and Five Hundred Dollar Forfeit Is Still Uncollected

By Wm. J. Chesak

SOME of the readers of the Welding Engineer may be interested in some of the welding which is being done out here in the southwest in the beautiful little city of Roswell, New Mexico.

About fourteen months ago there were indications of oil at Artesia, New Mexico, which is a small town about thirty-five miles from Roswell. After a number of months of prospecting, oil was found and the field became widely known. Large oil concerns and men with drilling rigs moved into this territory by the hundreds. They had to depend upon their own available equipment for all their work because they were two hundred miles from El Paso and an equal distance from any other city having shop equipment large enough to handle heavy forging.

Above—A Fabrication Job Turned Out by the Spring and Forging Company. Right—Welded Drill Stem Ready for Service.

Below—Finished Weld on Well Drill Stem.

That is how we came to have these photographs of a drill stem 5¼ in. in diameter, which was welded by H. R. Andrew, proprietor of the Spring and Forging Company of Roswell. To our knowledge this is the first successful job of drill stem welding with the electric arc which has been published.

The writer is a service man for the Acetylene Products Company of El Paso, Texas, manufacturers of Head-Lite acetylene gas, and distributors of equipment. Our territory embraces the entire southwest, so Roswell and the Artesia Oid Fields are on our route. As we sell arc welding as well as acetylene apparatus, we were very much interested in Mr. Andrew's drill stem welding.

There was considerable doubt in the minds of the oil companies and the drillers, as to whether this welding could be done successfully and stand up under the strenuous service which would be required of it, but Mr. Andrew is an expert metallurgist, and has had long experience in forging and making heavy welds, so the job was in good hands from the start. When gas welding was first introduced he immediately installed a plant and began using it to make repairs which could not be done with the forge fire and anvil. He made quite a reputation for himself in the gas welding line, then along came the arc welding process and his was the first shop in that section to install an electric welder, a General Electric, D. C. He has been very successful with all his undertakings in this direction also.

The photographs of the work in various stages of progress show that the procedure is simple enough, but special attention should be given to the fact that Mr. Andrew uses a gauge to keep the stem in line throughout the welding. The operator first welds on one side of the stem until the gauge indicates that he is drawing the stem out of line. Then the stem is rotated and the welding proceeds on the other side, which draws the stem back into alignment. This is continued until the welding is finished and ready for the blacksmith fire, and final forging down and sizing.

When the welding has been completed the stem is placed in the forge fire and brought up to a bright red heat. Then it is forged and dressed down to its original size. Being experienced in such welding, Mr.

(*Continued on page* 36)

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H. S. Card.....Secretary

H. S. Card.....Managing Editor
W. W Brothers.....Editor

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The Welding Engineer does not publish in its news or advertising columns any matter that deals with or refers to either personal or legal controversies.

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A Real Contribution to the Cause of Welding

HOW many thousands of dollars were spent by the A. O. Smith Corporation in experimental work, before the engineers of oil refineries and power plants were called in to witness tests of welded cracking stills and penstocks at Milwaukee, would be hard to estimate. To construct machinery for welding two-inch plate into high pressure equipment is not a job that is a matter of months. There is probably a lot of interesting detail information regarding the work that the welding industry will have to wait for until the time comes to give it to them. The Smith organization has done its part in tackling such a tough welding problem in such a determined way, carrying it through to a successful conclusion, and then putting the results before the engineering world. They are promoting their own product, to be sure, but they can't do it without at the same time giving one of the finest demonstrations ever made of the possibilities of fusion welding. No engineer who sees this work can be lacking in respect for a process which can join metals so efficiently.

Big Jobs Beckon to Good Welders

MOST of the big welding jobs which are being talked about in the industry require good workmanship. Operators are carefully picked for this work. But that doesn't mean that employers will only accept men who have had experience on big welding operations. Often they don't care a whoop about it, knowing how easy it is for a man who carried water on one of these jobs to claim that he was the chief welder. No, what they want is welders. A simple little weld on a test piece sends the bluffers on their way like chaff blown from wheat. The chief qualification is the ability to make a satisfactory weld. This is just as easy to learn in a small shop as in a huge plant. Very often it is easier. The man who is learning the trade today can look forward with perfect confidence to a place on the biggest welding projects in the country if he will set himself faithfully to learn two things; what a weld is, and how to make it.

Watch the Structural Steel Possibilities

IT is a pleasure to note that *The American Architect* carries in its issue of October 5th a splendidly prepared article dealing with the application of arc welding to structural steel work. The editors of *The Welding Engineer*, as a result of their contacts with architects, are certain that such information will be absorbed by this group with keen interest, and that individual representatives of the welding industry will be called upon more and more in the future to assist the architect with his plans. Every bit of available information on the subject will be useful to the man who keeps in touch with the developments in this growing field.

Here's a Cutting Job

NOW that Henry Ford has made his purchase of Shipping Board vessels there is a chance for everybody interested in the oxy-acetylene cutting process to give Henry some good advice on how to cut them into scrap. Everything in the way of equipment from torch lighters to oxygen plants may be purchased for the job. It will take a good force of expert cutters a long while to clean it up, too. Some people think the Ford Company are mistaken in their estimates of the cost on this undertaking. It is more probable, however, that the industry will learn some lessons in cutting efficiency before it is finished.

Six Holes in a Two-by-Four

TAKING the time to drill six holes in a two-by-four is one way to have torch tips always easy to locate. Some shop men get this far with the application of law and order, and then stop. But if you carry the same principle throughout the shop, what is the result? A shop with an agreeable appearance, equipment in good condition, and no time lost looking for things that are on the bottom of the pile.

Quick repairs by the oxy-acetylene process are made possible by easily portable cylinders of

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THE PREST-O-LITE COMPANY, INC.
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BATTERIES FOR AUTOMOBILES FARM LIGHTING RAILWAY SIGNALS AND RADIO

ARC WELDING SUCCESSFUL ON DRILL STEMS

(*Continued from page* 33)

Andrew knew that he had a good substantial weld, but the process was new in that locality when the first of these welds was made, and the drillers did not have much confidence in the strength of the finished job. In order to show how much confidence he had in it himself, and to prove that he knew what kind of a weld he was delivering, he put up a deposit in the bank, of five hundred doliars, to be used for fishing out the tools in case one of the welds broke.

At Left—The End Which Was Welded on Drill Stems. Right—Welding in Progress

On a recent trip to Roswell, Mr. Andrew informed us that the five hundred dollars are still in the bank, and no one has asked for any of it to pay the expense of fishing out tools lost through the failure of any of his welds. It has been a little over a year since the first stem was welded, and it is still holding, though it has been working every day since that time. He has ten of these drill stems working in the Artesia fields, which were welded with the electric arc.

WELDING ON BOILERS

By S. W. Miller

Past President of the American Welding Society

In view of the ever-widening applications of fusion welding throughout industry and the probability that repairs to boilers made in this way will be proposed from time to time, it is well that those responsible for the results should bear several points in mind. For simplicity, these are listed briefly below:

1. Most boilers are insured.
2. Many boiler insurance policies are so worded that if repairs are made without the authority of the company carrying the insurance, the policy becomes void.
3. There are Federal, State and Municipal regulations governing this work, as well as those issued by the insurance companies.
4. Only competent welders, used to boiler work, should be allowed to do the welding.

Therefore, the following precautions should be observed by the owner or his representative:

1. Examine the part of the boiler to be welded in company with the insurance company inspector, and get his approval before doing any welding.
2. Be present at the test after welding with the inspector.
3. If possible, get the inspector to sign a statement that the work has been properly done and that it has passed the test successfully.
4. If the boiler is not insured, and comes under Federal, State or Municipal supervision, carry out the above program in company with the proper authority.

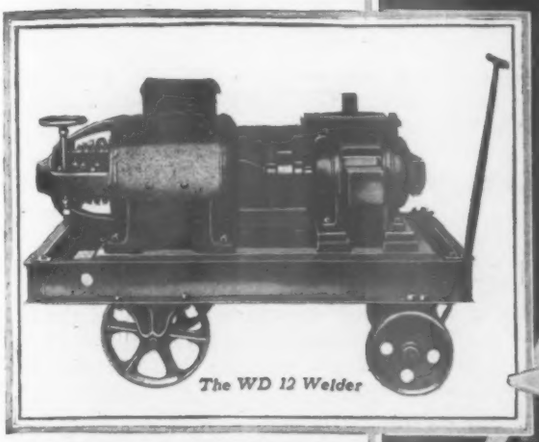
If the boiler is neither insured nor under supervision of some constituted authority, ample precautions should be taken by the welder and the owner to protect themselves against possible future trouble. They should make a sketch of the location and size of the repair, with a clear statement of what was found wrong and how the repair was made. They should always make a hydrostatic hammer test of the finished job, using a pressure of 1½ times the working boiler pressure, in the presence of witnesses, and get their signature to a statement of the facts. These papers should be carefully filed away. In such case, no welding should be done which is not permitted by law or by good practice.

In case of marine work, the welder should pass the regular examination of the Federal Steamboat Inspection Service.

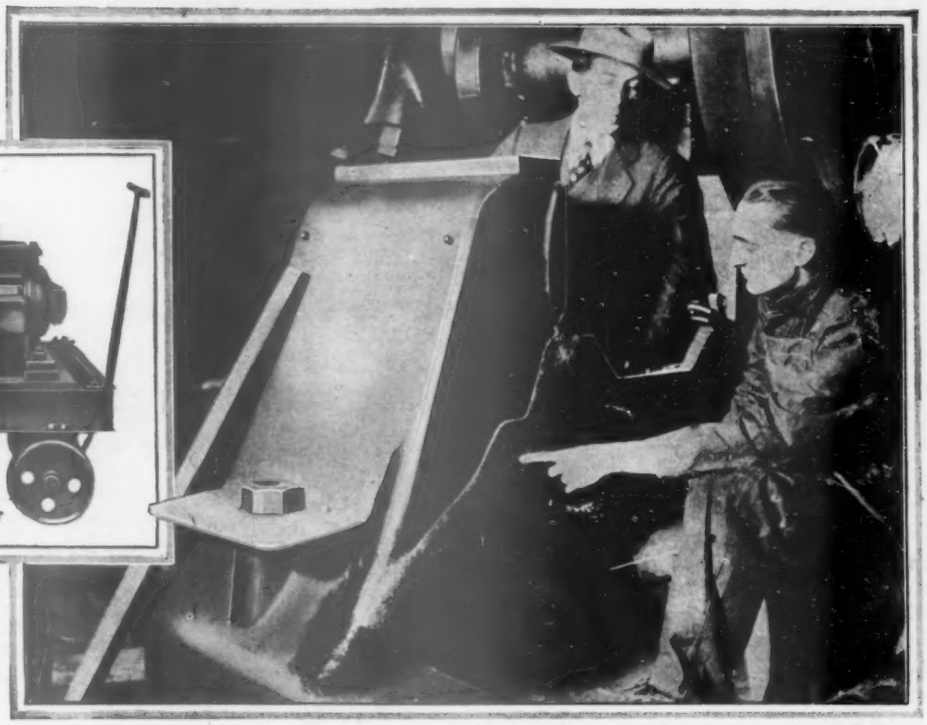
In all cases, the welder should make friends of the insurance and other inspectors by refusing to do work unless authorized by them, by being conservative in what work he recommends, and by doing nothing except a first-class job.

AMERICAN CUTTING TESTS ASTONISH EUROPEANS

Reports of cutting tests to determine how the purity of the oxygen used affects the efficiency of cutting operations have evidently proven a source of surprise to prominent members of the oxy-acetylene industry in Europe. Professor Keel, writing in the June, 1925, issue of the "Acetylene et Soudure Autogene" expresses astonishment at the differences found, and declares that they are not explained by any physical or chemical reason. Some other factors, he says, must enter into these calculations, such as the preheating flame, the heating of the oxygen in that flame in the case of tips with a central jet, the speed of discharge of the oxygen, the design of the tip, etc. P. Hollard, writing in the July issue of Revue de la Soudure Autogene, is more conservative in his comments, yet indicates that it is well to be somewhat reserved in drawing conclusions from tests of this character. He also points out the necessity for research to determine the other operating factors which affect the efficiency of gas cutting operations, and states that the cost of cutting is sometimes one hundred or two hundred per cent higher than it ought to be, due to the use of improper materials, the absence of system, and the incompetence of operators.



The WD 12 Welder



Broken pillow block of cast iron Ammonia Compressor at the American Trona Corp., Trona, Calif. repaired with a G-E Arc Welder and G-E Welding Electrode.

G-E Arc Welders Save Costly Delays and New Parts

An eight-foot crack—but G-E arc welding repaired it. The job took hours, instead of days or weeks, as would be the case if a new pillow block had to be secured and installed. And, when mended, the weld possessed greater strength than the compressor body.

Arc welding for repairs and emergency construction work eliminates costly delays and prevents dangerous risks. That corroded or worn place on boiler, retort, or pressure vessel can be patched immediately; leaking joints or cracked seams can be mended; a caulking, leak-proof deposit can be welded along the edge of riveted seams.

Speed and Simplicity are favorite characteristics of the G-E Arc Welder. Current is adjusted to suit the work by simply turning a hand-wheel. A reactor automatically steadies the arc. There are many to testify that a G-E Arc Welder soon pays for itself.

The Welding Specialist in your nearest G-E office can advise you.

The G-E line of Arc Welders includes types for all purposes. If you have standardized repetition work in joining or building up surfaces, investigate the G-E Automatic. It is the most economical, most efficient method.

28-15

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES

Problems Solved While You Wait

Men in the Oxy-Acetylene Industry Are Accustomed to Showing the Other Fellow a Way Out of His Troubles, Whether Welding Is Needed or Not

Dear Ed:

A few weeks ago while passing through a small town, I saw a sign reading "WE'LL FIX IT." It goes without saying that this sign was mounted on a welding shop. The thought struck me that this sign might well be considered a slogan for the whole oxy-acetylene industry because apparently this industry of ours has issued an invitation to the world in general to bring us their broken parts; to dump their problems and troubles at our door. And is the invitation accepted? The world, cock-eyed or otherwise, knows that it is.

Variety Is the Spice of the Industry

Some of the problems brought to members of the oxy-acetylene industry are apparently far removed from the usual scope of the welding and cutting torch. For example, take the case of the enterprising oxygen company that taught an ambitious bill poster how to spray paste on sign boards using compressed hydrogen. Then there is the new method of testing fire brick and other refractory materials at high temperatures in a furnace heated by oxy-acetylene burners.

Now I don't claim that all the problems attempted are successfully solved because there is the case of the chap who expected to cut down mahogany tree stumps close to the ground by means of a cutting torch. This man had three strikes called on him before he ever came to bat. Nevertheless, the uses of oxygen and acetylene continue to develop and spread and you may be interested in learning how we recently solved a rather unique problem.

A short time ago, I met an engineer who holds a position on the technical staff of a large, well known oil company. Some people in our industry who have made unfortunate exchanges of hard earned money for beautifully engraved oil stock certificates are suspicious of oil men. This engineer, however, never tries to sell oil unless it is in a barrel or a can and anyway, I never am burdened with enough money to become financially interested in things other than the necessities of life, so he is a safe associate.

An Oil Man in Trouble

When I met him he wore that troubled, pensive expression such as a flapper assumes when she can't quite decide whether to order a strawberry or a chocolate soda. I knew that something was on his chest and I also knew that I'd have to put on ear muffs to keep from hearing about it, so I told him.

"All right; go ahead and spill your grief into my already overtaxed ears. Might as well hear about it now as later on. Has somebody invented a substitute for oil; is Congress considering another amendment that will require an engineer's prescription for every gallon, or what is it that's worrying you?"

"I'm afraid that this one is way over your head. It's too deep for you," he replied sadly.

Welded Planes Have Circled the World

"Aviation," says I, "has long since been added to the menu of the oxy-acetylene industry. Properly welded joints carried our planes around the world. The depths of the sea are traversed by submarines in whose construction the welding torch and the cutting torch played important parts. There are mighty few things over, under or on the wrinkled face of Old Mother Earth that we don't have something to do with. Therefore, out with your troubles."

"The same applies to lubrication only more so," says he, "and the puny little problems you wrestle with are nothing compared with the troubles and worries that are attached to the proper lubrication of all the contraptions that clutter up this world of ours. Right now I'm trying to figure out a way to test lubricating oil for door checks used in Alaska. That's just a sample of the problems that are constantly being put up to us."

"Explain yourself," I tell him. "The term door checks means as much to me as does the Chinese word for soup. I know what a door is and often have I bemoaned the fact that we no longer see the little swinging ones that offered such feeble resistance to our entrance into the old time corner refreshment parlors.

"Furthermore, I know what a check is. Many times have I checked my battered hat in a check room and wondered whether or not the hat was worth the ransom that must be paid for its recovery. But a door check, especially in Alaska, beats me unless it means that the people up there check their screen doors every Fall instead of storing them in the basement during the winter months."

Lubricants for Door Checks Wanted

"You're wrong, as usual," says the engineer. "The kind of check I refer to isn't a brass tag, neither is it the sort of check you mulct from your boss on the first of the month. Did you ever see a door equipped with a little cylinder-like device that automatically closes the door? Well, that's a door check. The Alaskan Railroad has put such devices on its trains so that in the winter time, the passengers won't stand a good chance of freezing every time some negligent person forgets to close a door."

"Seems to me I've heard about that," I respond. "In the winter when the thermometer has sunk to depths obtained by few people outside the oil industry, some careless guy would enter and leave a nicely warmed car without closing the door behind him. The regular commuters would immediately have to scramble for their wraps and this made them so mad that they would stop the train, organize a mob and lynch the offender to the yard arm of the nearest telegraph pole. The enraged commuters broke off so many yard arms and insulators that the railroad had to do something about it so they put on automatic door closers and——"

"Hold on a minute," interrupts the engineer, "regardless of the reasons which prompted their installation, these door checks have been put on and now they've got to be lubricated."

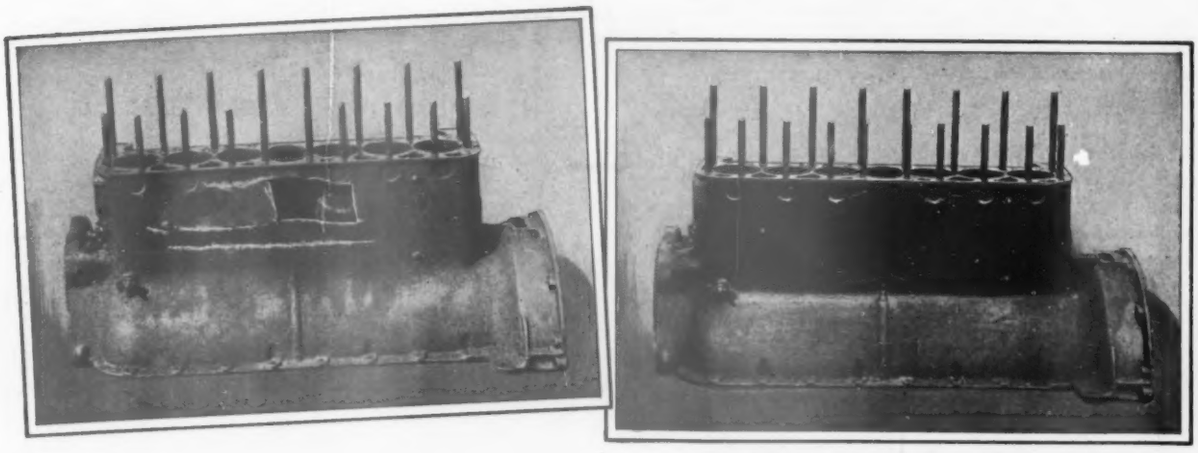
"I've heard you referred to as an oil can," says I, "go to Alaska and get yourself an honest job."

"Ordinary oil freezes," he says, ignoring my suggestion, "at the temperature of a cold day in Alaska. I've got some oil that I don't think will freeze but it must be tested out under conditions approximating those existing in Alaska during the winter months. The question is, how to test it."

"I'd suggest sending Doc Cook up there to try it out except that Doc's at present inhabiting one of our prominent hoosegows and wishing for a cutting torch and a few tanks of gas so as to let himself out. I'd like to see you go there yourself because it means at least a six months' trip if you start now but I suppose that's out of the question. If I were you I'd tell the railroad company to take the doors off all their cars because then the commuters couldn't get mad about somebody forgetting to close one."

"The oil has to be tested here," says the engineer, "when

TOBIN BRONZE WELDED



This illustration shows the water jacket welded and painted—as good as new.

Here is a job typical of the class of work being done on cast iron with the aid of TOBIN BRONZE Welding Rods.

Actual time on job—three hours. Material used —one lb. of ⅛" Tobin Bronze Welding Rod and 30 cubic feet each of Oxygen and Acetylene.

Tobin Bronze is conceded to be the best welding rod for repairing or building up cracked or broken cast iron parts of any size or description. It can be applied at a dull red heat without pre-heating, and the weld thus made is stronger than the original cast iron.

Tobin Bronze Rods, manufactured solely by The American Brass Company, can be secured from leading Distributors.

Descriptive pamphlet, including tables of weights, melting points, also suggestions for welding with Tobin Bronze, sent upon request.

THE AMERICAN BRASS COMPANY
GENERAL OFFICES: WATERBURY, CONNECTICUT
Offices and Agencies in Principal Cities
Canadian Mill: ANACONDA AMERICAN BRASS LTD.
New Toronto, Ont

TOBIN BRONZE
REG. U.S. PAT. OFF.
WELDING RODS

it goes to Alaska it must be accompanied by our guarantee that it won't lose its lubricating qualities at 40 below zero."

Liquid Air Duplicates Arctic Temperatures

"Well, if there's no other way out," I tell him, "The oxy-acetylene industry will solve your little problem. Bring a sample of your oil and a door check out to an oxygen plant I know of, and I'll guarantee to duplicate arctic temperature conditions."

A few days later he assembled his paraphernalia and we took it to the oxygen plant. We stopped on the way to pick up a thermometer graduated to 50° below zero and two gallons of denatured alcohol.

Arriving at the plant I first carefully explained to the operator that the alcohol we brought was not suitable for beverage purposes but was labeled with the usual skull and cross bones. One of the truck drivers came over, smelled the alcohol and acted as if he wanted to taste it but we talked him out of this idea. While we were thus engaged the operator hid the shellac sometimes used to put on gaskets, so the truck driver stayed thirsty.

After putting some oil in the door check we had brought along it was then put in a bucket in which we poured the alcohol. Then we persuaded the operator to draw some liquid air from the oxygen plant.

This liquid air is the same sort of air we breathe except that it is so cold that it has condensed to liquid form. In getting oxygen from the air the air must first be liquified and this intensely cold liquid can be readily drawn out of the column of the plant. The liquid has a temperature of over 300 degrees below zero. It's colder than the heart of a taxi-cab meter.

"We'll Fix It." What Next?

We stirred liquid air in the alcohol until the thermometer read 40 below zero. We knew that the door check immersed in this cold alcohol would gradually assume the same low temperature. After a short time we took out the door check and found that it worked. The oil hadn't lost its lubricating qualities despite the cold and everything was o. k.

The oxy-acetylene industry had solved the problem of testing lubricants for door checks in Alaska. "WE'LL FIX IT." What next?

Your old friend,

Ursus.

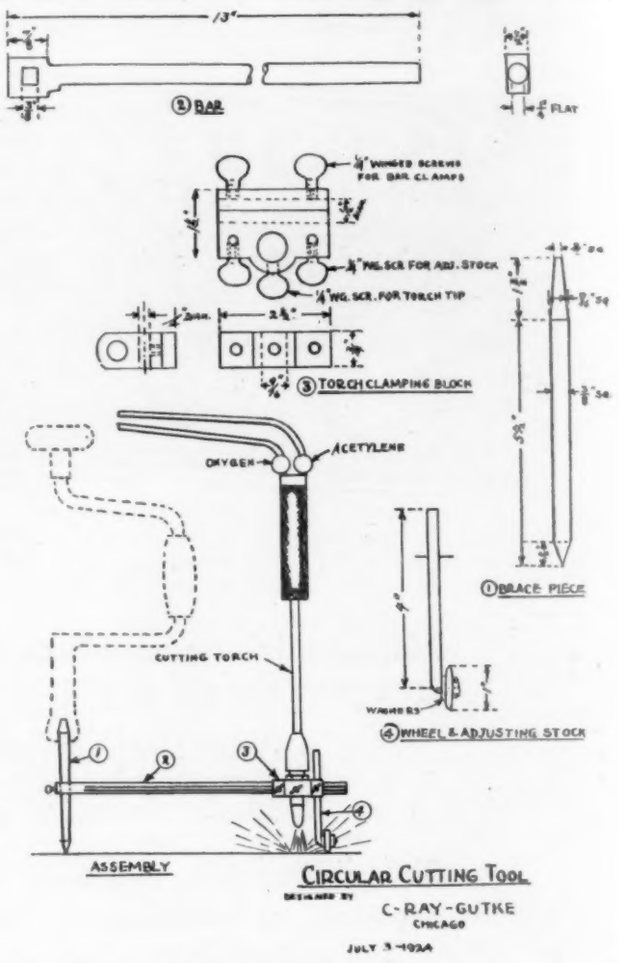
ETCHING TEST FOR FILLER ROD

For several years the Chicago Steel & Wire Company, Chicago, Ill., has been engaged in research, studying th characteristics of steel wire which affect its welding qualities, and has just issued a booklet which contains some of the results obtained from that study. One of the conclusions arrived at from studying rods of different structure is that steel in which the sulphur is segregated to the center is peculiarly resistant to hydrogen absorption, and that hydrogen absorption constituted a major factor in determining good and bad filler rod. A test was therefore developed to aid in the selection of steel rod which had the greater portion of the sulphur segregated in the center.

A piece of rod, one end of which has been ground fairly smooth, is put into a glass of dilute acid maintained at a temperature just below the boiling point. After prolonged immersion the outside shell, will either be eaten away irregularly, showing sulphur to be distributed throughout the steel, or the center core will be eaten away leaving the outside shell scarcely affected, showing segregation of the sulphur. As there are all gradations, some little experience is required in judging the etched end of the rod. Except for this experience, which can be easily acquired, the test is so simple that any welder may apply it. No microscope is required, simply about an ounce of acid, preferably muriatic, and a container of about one pint capacity, which may be heated to boiling temperatures and which is not affected by the dilute acids.

CIRCULAR CUTTING TOOL

For cutting circles in both horizontal and vertical plates with the oxy-acetylene cutting torch, operators will find the device shown in the accompanying drawing very handy and efficient It was designed by Mr. C. R. Gutke of the Torchwelding Equipment Company, Chicago, Ill. The device makes use of a carpenter's brace and the other pieces which go to make it up are easily put together in the welding shop.



THE MACKINAC DISASTER NOT DUE TO WELDED BOILER

Members will recall reading of the unhappy accident causing 44 deaths and numerous injuries aboard the S. S. Mackinac, off the Newport News Coast on August 19th.

Promptly, the public press charged the blame to a welded boiler, or at least intimated such a cause. Thus:

Blames Welded Boiler for 44 Deaths on Ship

(By the Associated Press.)

"PROVIDENCE, R. I., August, 21.—Chief Engineer John Grant of the Mackinac, the boiler of which exploded in Newport harbor, Tuesday, causing forty-four deaths so far, testified today at a hearing before Inspector George Uhler of the United States steamboat inspection service that the boiler had been leaking Monday and that it was welded before the excursion left Pawtucket Tuesday."

In "POWER," August 25th issue, an interesting account appears, which refutes the story by saying that "Examination does not reveal any signs of the welding of any part of the boiler."

This article goes on to explain the cause of the explosion, which it says was due to the rupture of the circulating drum sheet which was old and corroded.—*C. T. Allen in a recent G. P. A. Bulletin.*

195 lb. Pressure District Steam Heating Main, Installed for Union Electric Light and Power Co., St. Louis, by American District Steam Co. A 20" Pipe Bend is Show Here

Welding on Steam Mains

10,000-Foot Steam Main Installed for the Centralized Steam Heating System of the Union Electric Light and Power Company at St. Louis

FOR some time it has been considered a wise and economic practice to use electric welded construction in the building of pipe lines in the oil fields. Thousands of feet of pipe have been laid by this method in the oil fields of the Southwestern states.

The unusual success of electric welding in this field naturally brought other users of pipe lines to a realization of its possibilities. Perhaps one of the most exacting tests made upon the strength and dependability of electric welding in the pipe line construction is to be found in the 10,000 foot steam main composed of pipe ranging from 10 to 20 inches in diameter recently installed for the centralized steam heating system of the Union Electric Light and Power Company at St. Louis, Mo., by the American District Steam Company of North Tonawanda, New York.

St. Louis, like many other of the large cities, has learned to depend upon live steam supplied by a private company to heat many of its large office buildings, hotels, clubs, banks, department stores, restaurants, theatres, picture shows, printing plants, manufacturing plants and general mercantile establishments. Almost every bank and department store in St. Louis depends upon this system of centralized live steam heating.

With such an important clientele it becomes obvious that the arteries built to convey the steam would have to be constructed along the most dependable lines. Before any actual construction took place, thorough tests covering the various possible methods of pipe joining were made. The butt welded construction by electric arc with reinforcing head inside proved best, it standing a strain of 78,950 pounds before a rupture occurred. Even at this great weight it was the pipe that broke while the weld showed no sign of rupture.

Then came the actual construction. Extra heavy steel pipe was supplied with beveled ends, ready for welding. All pipe joints and joints to the steel body fitting, both expansion joints and street corner specials were made by the electric arc weld process, the current used being generated by the Lincoln Electric Company's "Stable-Arc" welders. Each of the pipe joints was reinforced by four 5-inch by 10 inch steel plates equally spaced longitudinally around the pipe and thoroughly welded around the entire outer surface. These acted, so to speak, as four clamps over each pipe weld.

End Blanked off on 20" Pipe Ready for 500-pound Hydraulic Test Before Application of Covering

According to the possible strain that such a construction will stand, as shown by the tests that were made, the owners are certain of years of steady service under the constant wear of 250 pounds pressure of superheated live steam which passes through the pipe twenty-four hours a day.

A complete description of construction details is as follows. Two lines of four-inch drain tile were laid in the bottom of the trench and five inches of crushed stone placed over them as draining facilities. A concrete base five inches thick was laid to a careful grade over the crushed rock. Side walls of the conduit were built up in cement and lime mortar and multicell hard burned vitrified tile. The alignment guides were built in the conduit near the slip end of each expansion joint.

After the pipe was welded together as described above, each section between expansion fittings was tested with a hydraulic pressure of seven hundred pounds per square inch by blanking off the ends. Corrugated sheets of iron were used for forms on which the concrete top was poured. Reinforcing rods were placed every ten inches across the top. Brick manholes were built around the expansion joints and joined to the conduit. Crushed stone was used in back-filling part way up the sides of the conduit and then dirt was carefully tamped in.

Altogether 45,000 lineal inches of welding were performed with the Lincoln equipment on this installation. The St. Louis job, the proper functioning of which affects thousands of people depending absolutely on this live steam service, illustrates why the choice of electric welding, the agent by which thousands of pieces of pipe were changed into one mighty continuous system, had to be based upon absolute knowledge of its ability to give satisfactory service at all times.

Operator at Work on 20" Pipe Joint. Plates Across Pipe are 8"x4"x½"

The choice of electric welding in this case marks one of many great steps forward which arc welding is making possible in the field of construction. Since it can be depended upon in a place where both pressure and heat strains are constantly at work, it can be used successfully and to an advantage where ever there is metal to be joined together.

WILL PROMOTE COMMERCIAL USE OF CARBON ARC

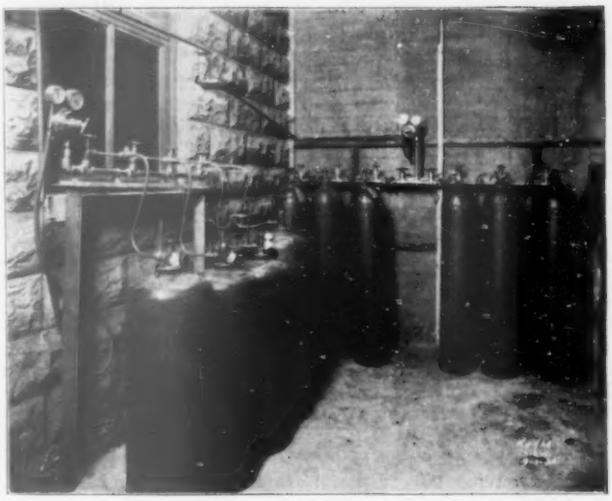
The Una Welding & Rail Bonding Company of Clevland, Ohio, who has specialized for a number of years in the development of equipment and supplies for applying rail joints and rail bonds by the carbon arc process, are planning to develop a commercial field for carbon arc welding. The equipment which they manufacture is said to be suitable for commercial welding and the engineers of the company are convinced that there is a big field for the use of the carbon arc welding process outside of its application in street railway work for rail welding and bonding. The Cleveland company will also market electrodes specially prepared for use with the carbon arc process.

Front Entrance and Office of a Modern Welding Shop

MILWAUKEE FIRM INCREASES SHOP EQUIPMENT

The Bastian-Blessing Company of Chicago, Illinois, reports that they have just installed a complete Rego installation consisting of manifolds, pipe lines, regulators and torches in the plant of the Weimer Welding and Cutting Company of Milwaukee, one of the largest welding shops in the state of Wisconsin. One of the photographs reproduced here shows the attractive front of the shop occupied by this company. The entrance to the shop itself is in the rear. There are two doors in the rear entrance large enough to permit taking in big jobs such as auto trucks, boilers, etc. The photo taken of the office indicates that this firm believes in being up-to-date and business-like in every respect. Mr. Weimer himself is shown at the adding machine. He was born in Germany and learned his profession there. Then he came to this country and worked for a number of large concerns who adopted welding in the early days of its development. He started for himself as a job welder twelve years ago. He is an expert and thoroughly experienced welder in all classes of electric and oxy-acetylene welding. Some of the largest concerns in Wisconsin call upon him to do large or special jobs even though they are equipped with welding apparatus and competent operators. Mr. Weimer employs eight men steadily and does both job and contract welding.

The photographs of the interior of the shop indicate that it is completely equipped for all classes of gas and electric welding.



Manifolds for Both Gases

The pipe line installation was made under the direction of engineers of the Bastian-Blessing Company. A close up view is shown of the manifold house. Mr. Weimer favored the manifold and pipe line system because cylinders took up floor space which could better be devoted to jobs, time and labor is saved by not

Interior View of the Weimer Shop in Action.

having to move cylinders around the shop, more time and labor is saved because a supply of gas is assured for all jobs all the time with little or no danger of an operator running out of gas while doing a large and important job. The manifold system also permits keeping the cylinders at proper temperature at all times and saving gas which might otherwise be lost through the carelessness of operators. The cylinders are also, of course, better safe guarded against possible accident.

1925 ANNUAL MEETING OF A. S. M. E.

November 30th through December 4th are the days when the Forty-sixth Annual Meeting of the American Society of Mechanical Engineers will be held in New York City. Judging from the list of outstanding speakers and from the advance plans for technical sessions, the meeting will attract an attendance that will exceed the 1924 event, which was the largest the Society ever held, with 2174 registered. The Professional Divisions have been at work on their programs in cooperation with the Committee on Meetings and Program since April and efforts are being exerted to complete the program for publication in the October 22nd issue of the A. S. M. E. News. About forty-five papers will be presented at the meeting.

One of the feature events of the meeting will be the presentation of Honorary Membership in the Society to the Honorable Herbert Hoover and to Past-president Worcester R. Warner. This event will occur on Tuesday evening, December 1st, just preceding the presidential address by Dr. William F. Durand.

An innovation at the coming meeting will be the delivery of the first Henry R. Towne and Robert Henry Thurston Lectures. The Towne Lecture will be given on Tuesday afternoon, December 1st, at 4:30 p. m. and will deal with the relation of Engineering and Economics. The Thurston Lecture on Engineering and Science will be given Thursday afternoon, December 3rd, at 4:30 p. m. The lectures are to be elected by Council at the Altoona Meeting of the Society.

Progress Session—The Business Meeting on Wednesday afternoon will be featured by the usual Council report and by an especially valuable report on the Study of Mechanical Engineering Education. It will be followed by a General Session at which each of the Professional Divisions will present reports of progress in their particular fields during the past year. These reports should be of tremendous value in establishing the research and standardization programs of the Society.

National Defense Session—The auditorium of the building will be used for the National Defense Session on Thursday evening when industrial leaders will report the progress that is being made in perfecting the national program of industrial preparedness.

Machine Shop and Machine Design—The renewal of activity in this important field of mechanical engineering is demonstrated by the fact that there will be five sessions at the meeting. The topics to be discussed include—belt transmission, optical measurement, gears, machine tool design, spring design, lubrication, torsional stress in shafts, vibration in steam turbine buckets, and vibrations in shafts.

Management—Two sessions are listed for management discussions on industrial psychology, plant design, production control of newsprint manufacture, and fatigue. The Taylor Society is co-operating in this program.

Session With A. S. R. E.—The A. S. R. E. is co-operating in one session which will take up centrifugal compressors in two papers, one dealing with the centrifugal compressor as a refrigerating machine and the other discussing the heat balance of the centrifugal compressor.

Industrial Session—The problem of materials handling will be discused from the point of view of safety in one session. The Wood Industries promises a strong program of papers in its field. The Textile discussions will include weaving machinery and motor applications to textile machinery. The Aeronautics Session will deal with the commercial possibilities of the airship and recent technical advances in aeronautics.

An important session will deal with training for industries and receive reports on apprenticeship abroad and apprenticeshi in the building trades.

Fuel and Power Sessions—This phase of the program will be approached from many more angles than usual. Industrial furnaces will be dealt with exhaustively in one session. The Oil and Gas Power Session will take up transmission marine auxiliaries and large gas engines. Industrial power will come in for thorough discussion centered about papers on higher steam pressures and industrial power costs. Power plant material will furnish the topic for a strong session at which steel castings, bolt materials, boiler tube corrosion, and refractories will be discussed. A general power session will deal with radiant heat absorption, the effect of steam bleeding and recent developments at the Colfax Station.

The usual progress reports on the steam investigation and a public hearing on the Power Test Codes will also be held.

A MEETING OF "DRY LIQUID" CONNOISSEURS

"A gas is a dry liquid," according to one college student's definition. The classroom has produced many similar gems: "When heat is applied to gas the molecules are stimulated to get away from the heat. They bump together and cause the molecular hypotheseis. Each molecule moves on its own track."

Some classroom remarks about gases are illuminating: "Ammonia is sometimes called spirits of shorthorn. Sulfurated hydrogen is a gas of pugnacious odor. All is not chlorine that smells."

A Chinese student once wrote, "The properties of CO_2 are, can't smell, can't see, little white;" and another embryo scientist reported, "When lighted, the hydrogen squealed."

The gas industry is an interesting one, in the classroom or without. That is one reason our Association gatherings are interesting. Another is that our members bring to those gatherings, stimulating thoughts, a desire to work out common problems by exchange of ideas, and true good fellowship.

This is how John H. Luening, Secretary, introduces the subject of the October Luncheon of the Compressed Gas Manufacturers' Association, which is scheduled for Thursday, October 15, at the Hotel Astor, New York.

S. A. F. IN NEW HOME

La Soudûre Autogene Francaise, one of the largest welding equipment supply houses in France, with six factories and twenty-two branch offices, recently moved its headquarters into a large four-story building situated at 29 rue Claude-Vellefaux, Paris. Starting with a modest capital of a hundred thousand francs in 1909, as manufacturers of acetylene apparatus, it has increased its influence, absorbed other companies, and expanded generally until today its capitalization has reached six million francs. It is now active in the development of all forms of gas and electric welding, selling the necessary apparatus and supplies, installing the equipment, organizing welding departments, conducting research work in its own laboratories, and operating large shops for both production and repair welding.

NO LEAKS IN UNION LEAGUE POOL

When the story was being prepared regarding the welding of the swimming pool on the twenty-first floor of the new Union League Club Building in Chicago, for the September issue of *The Welding Engineer*, the job itself was just undergoing the finishing touches, so the welds had not been tested. Since that time Mr. Jardine, proprietor of the Western Welding and Equipment Company, who had the welding contract, has informed the editors that when completed the tank was subjected to the specified test, and showed on the first trial that there was not a single leak in the entire job.

STRATE IN CHARGE OF NEW AIRCO DISTRICT OFFICE IN MILWAUKEE

Following the purchase of the carbide business of the Gas Tank Recharging Company of Milwaukee, Wisconsin, including acetylene plants in Milwaukee and Bettendorf, Iowa, and a carbide plant at Keokuk, Iowa, the Air Reduction Sales Company has created a new district with office in Milwaukee at 1296 Forest Home Avenue, in which city an Airco oxygen plant has been in operation for some time. The new district is in charge of J. S. Strate, district manager. The new district territory comprises parts of Wisconsin, Michigan, Illinois and

Iowa, within an average radius of about 100 miles. There is maintained at this new office in addition to supplies of Airco oxygen and acetylene and Airco-National carbide, a complete stock of Airco-D-B apparatus and supplies.

CLEVELAND SECTION ELECTS NEW OFFICERS

The following is the result of the election of officers of the American Welding Society, Cleveland Section, for the season of 1925-1926:

John H. Thornton, chairman; R. B. Fehr, 1st vice-chairman; J. A. Bickel, 2nd vice-chairman. Executive Committee: O. G. Berneman, R. J. Hurt, Mathew Daley, H. Gnewetta, Judson Wolcott, Thomas Parker, Roy Palmer, H. E. Winkleman, Carl King, John Menzies. Treasurer, G. B. Close; secretary, R. K. Randall. Membership Committee: R. P. Palmer, R. J. Hurt, chairman, Mathew Daly, J. C. Menzies, James Dick. Papers Committee: A. F. Davis, Roy Malm, H. E. Winkleman, J. C. Menzies.

COPPER ALLOY RODS HAVE DIFFERENT PROPERTIES

From a booklet entitled "Anaconda Non-Ferrous Welding Rods" recently published by the American Brass Company, the welder is able to get considerable information regarding the uses of different kinds of copper alloy rods. He learns, for example, that in the welding of copper parts of welded copper to steel the use of a rod of commercial electrolytic copper is recommended. For electrical work, however, where a stronger joint is required, the addition of silicon to a copper rod raises the strength of the joint with the least possible increase in the electrical resistance. A still tougher and stronger joint can be made by the use of the phosphor bronze rod which is often preferred by electric welders. The phosphor bronze rod, however, is not held to be as strong as tobin bronze, the latter being recommended for its density, uniformity, malleability and high tensile strength. It is also claimed that this type of rod flows freely at welding temperatures and gives a weld which is as strong as a good steel welded structure and stronger than a cast iron weld. A good many welders are already familiar with the popularity of this rod for cast iron work where it is desired to get away from preheating. An unusually strong joint can be made with manganese bronze which has a low melting point but it is not recommended for joints where great ductility is desired. The muntz metal rod which melts at a slightly lower temperature than brass and makes a stronger joint is recommended for brazing operations. The carbon brass rod can be used for repairing brass castings and also for some brazing operations but it does not have the strength or resistance to wear which is characteristic of welds made by some of the alloys mentioned above.

NEW FLUX MADE BY HOXITE COMPANY

"Hoxite" is the trade name for a new universal welding and brazing flux manufactured by the Hoxite Company of Stamford, Conn. This flux is recommended for aluminum, cast iron, malleable iron, brass and bronze, particularly for vertical welds and for jobs where carbon molds are customarily used to lay on new metal in building up operations. It is claimed by the manufacturers that the flux practically eliminates frothing and blowing and is free from disagreeable odors.

HINTS ON ARC WELDING

"The great difficulty in making a 100 per cent weld in metal arc welding," says The Welders' Guide, a booklet published by the Steel Sales Corporation, Chicago, "is the trouble caused by the puddle overlapping on cold metals. The arc should be held at the base of the puddle. To make the bead smooth watch the way the puddle cools and make corrections by holding the arc on top of the puddle momentarily. When we place a second bead inside the first so as to start a pad we have a different condition. We are welding against the plate on the bottom and against the bead on the side. The arc should be held at the base of the puddle and particular attention should be given to the first corner where the first bead and the plate join. It is not sufficient to just touch the side of the first bead with the arc because this will leave a deep ridge between the two beads. The arc should be brought up momentarily to the first bead. This does away with the ridge between the two beads. In order to secure a perfect weld on heavy work there must be a complete fusion of the electrode material with the previously deposited material and also with the parent metal if the range of the arc includes any of the latter.

REX SUPPLIES FOR WELDERS

Notice has been received that the line of arc welding accessories manufactured and sold by the C. H. Hollup Corporation, 327 South LaSalle Street, Chicago, will in the future be known by the trade name of "Rex." This trade name is also applied to the Hollup line of bare wire electrode and welding rods for oxy-acetylene welding. The list of accessories includes electrode holders, face shields, helmets, welding glasses, sand blasts and flexible cable.

CURRENT WELDING LITERATURE

ELECTRIC POWER SUPPLY TO THE WELDING INDUSTRY.—The cost of serving customers with power for electric welding outfits are proportionate to the amount of enegry used to the greatest demand for power with additional costs which are independent of both of these. The current is used in this industry both for welding and for the manufacture of electrolytic oxygen. The multiple arc welder is equivalent to a number of machine tools driven from a single shaft. Spot welders need a low power consumption with a large investment. A-C arc welders are not a particularly desirable load but can usually be accepted. Spot welders are assumed to be used about one-third of the time, arc welders about one-third of the time and butt welders about one-fifth of the time. The welding customers should pay for the use of facilities furnished.—The Welding Journal, London, September.

THE INSPECTION OF WELDS IN PRESSURE VESSELS, by S. W. Miller.—Paper read before the American Welding Society, April, 1925 meeting, points out that the inspection must cover design, material and workmanship. Good operators are essential if good welding is expected. The bottom of a single "V" weld should always be examined. In other words, the proper inspection of a welded pressure vessel must begin back of the actual welding and must include everything that goes into the construction.—The Welding Journal, London, September.

PROPERTIES OF STEEL FILLER RODS FOR GAS AND ELECTRIC WELDING.—Booklet distributed by the Chicago Steel & Wire Co., 103rd St. and Torrence Ave., Chicago, Illinois. The first part of the book is a treatise on steel filler rods, discussing the method of manufacturing filler rods; the difference in the manufacture of filler rods for gas and electric welding; the causes of failures in welds; the effect of gas in filler rod with particular attention given to the effect of hydrogen gas and the importance of keeping it out of the filler rod; how water gets into the filler material, the effects caused by it and how they may be prevented; how filler rods are subjected to heat treatment during manufacture; the general significance of the chemical analysis of the filler rod; effect of this analysis on both gas and electric welding rod; uses of flux coatings and the general composition of these coatings. Following this treatise is a catalog description of 11 different brands of gas and electric welding wire.

WELDING WHEEL TIRES.—The old fashioned way of welding wheel tires in forges requires two or three workmen and is a process which makes it difficult to produce a tire of the exact diameter desired. When oxy-acetylene welding is substituted for the forge welding process one man can do practically all of the work and the only preparation necessary is bevelling the ends to be welded with a cutting torch.—Revue de la Soudure Autogene, August, 1925.

REPAIRING OIL SOAKED CRANKCASES, by A. DesGranges.—Aluminum crank cases which have been long in service become so thoroughly soaked in oil that they are very difficult to weld with complete success. The minute cracks under which the oil penetrates are not distinguishable, but they are very apt to be present especially in the vicinity of a crack. The difficulties presented here may be relieved somewhat by increasing the extent of the beveling by liberal use of flux and wire brushes, after the welding line has been raised to the fusion temperature and allowed to cool.—Revue de la Soudure Autogene, August, 1925.

ELECTRIC WELDS SHOULD BE REINFORCED.—An operator wishing to test the strength of welds made a series of tests on ⅝ inch thick boiler plate 3 inches wide. Ordinary mild steel electrodes of ⅛ inch diameter were used. The efficiency of the joints welded on both sides was 90%. The efficiency of joints welded on one side were 83%. The ratio of the welded metal to the original was 63% with plain electrodes and 71% with flux coated electrodes. The average tensile strength per square inch on welded metal at the break was 1238 pounds. The author concludes that if the specimens had been reinforced at the weld to approximately 150% of the original size the strength of the welded specimens would have been equal to the original.—Coal Age, September 17th.

CONSTRUCTION CODE OF THE A. S. M. E.—Reprint of that part of the A. S. M. E. Boiler Code which applies to welded unfired pressure vessels with sketches showing the methods of welding nozzles and heads on such vessels.—Acetylene Journal, October, 1925.

EXPANSION, CONTRACTION AND PREHEATING.—How the changes of temperature affect the dimension of metal pieces and methods of providing for the expansion effect during the welding operation. Controlling expansion of various metals and allowances necessary to make for expansion when welding sheets or plates. Methods and types of equipment used for preheating.—Acetylene Journal, October, 1925.

WELDING CAST IRON WITH BRONZE, by S. W. Miller.—The use of bronze welding for rapidity, small amount of preheating, relief from welding stress, the strength of the bronze itself and its low melting point. It is a useful process where strength is needed or where a bearing service must be provided.—Acetylene Journal, October, 1925.

WELDING A HEAVY STEEL CRANKSHAFT.—Heavy shafts should be beveled to 90 degrees from each side after the shaft has been lined up and clamped into place. Penetration is a vital requirement in shaft welding and also the selection of the proper filler rod should be given careful attention because the weld should be as strong as possible. If the shaft is properly lined up and preheated it will come through without warping.—Acetylene Journal, October, 1925.

WELDING IN RAILROAD SHOP PRACTICE.—A description of the equipment and methods used in the Santa Fe shops at Albuquerque, N. M. How operators are tested, how welders are furnished with complete instruction covering their work.—Railway Electrical Engineer, September.

WELDS A MILE LONG REFINERY STEAM LINE WITHOUT EXPANSION JOINTS, by Paul Truesdell.—Description of welding operators on a steam line for a big refinery. Sketches show the design of joints used as well as devices made up on the job to facilitate the handling of materials.—National Petroleum News September 16th and 23rd.

WHAT YOU CAN DO WITH AN OXY-ACETYLENE TORCH.—Folders recently prepared by the Murdett Mfg. Co., Chicago, Illinois, containing a discussion of the progress which has been made in oxy-acetylene welding in the welding of various metals and in different classes of work. The inside pages of the folder contain an alphabetical list of a thousand articles which have been welded.

MECHANICAL FEATURES OF A SUCCESSFUL SPOT WELDER.—The September issue of the A. E. F. Welding Illustrated, the house organ of the American Electric Fusion Corporation, Chicago, Illinois, carries a cut away view of a spot welder with the different parts numbered so that the text is able to present a complete description of all of the operating parts of a resistance welder.

NEWS OF THE WELDING TRADE

J. M. Robinson, who was formerly manager of the Grand Rapids office of the Lincoln Electric Company, has been transferred to Detroit, and is to have charge of the Detroit section. G. W. First has been changed from the Boston office to the Grand Rapids office, and J. E. Durstine from Chicago to the Buffalo office.

The Dealers Equipment Company, 3673 South Michigan Ave., Chicago, Ill., have been appointed distributors for the Todd Twin Pole Arc Welder. Mr. Hall is in charge.

The name of the Federal Tool & Alloy Steel Corp., Brooklyn, has been changed to the Swedish Iron & Steel Corporation.

The W. C. Gilmore Corporation, which was recently organized in Waco, Texas, will manufacture acetylene generators, fixtures and coolers, etc., at 703 North 6th Street, Waco, Texas.

A new factory is planned for the Youngstown Welding Company, Youngstown, Ohio, and it is expected that the construction work will be undertaken next spring on a piece of ground along the Youngstown & Austintown railroad. The company is the manufacturer of the well known Weldco truck tanks.

Lorn Campbell, Jr., of the U. S. Welding Company, Minneapolis, has been scpending several weeks on the Pacific Coast.

Walter Verkamp of the Ohio Electrolytic Oxygen Company has just been enjoying an extended trip to Europe.

It is reported that a new welding and repair shop will soon be erected at 102 Hudson Street, Hartford, Conn., by Jonas Harris of that city.

Announcement has been made of the appointment of C. P. Clampitt as sales manager of the Burdette Mfg. Company, Chicago, succeeding W. R. Noxon, who resigned September 1st.

On October 1st the Carter Welding Company, Toronto, Canada, moved their equipment and office from 165 Adelaide Street, West, to 289 Adelaide Street, West, Toronto.

S. A. Kelly, representative of the Todd Twin Pole Arc Welders of New York City, was a visitor in Chicago, September 21st and called on a number of important welding shops in Chicago to observe the type of work which is being done in the city.

A new plant is under construction in Enid, Okla., for the Miller Boiler & Tank Company, which will use the plant for the production of welded, bolted and riveted steel tanks and other oil field equipment. The president and general manager is Mr. T. L. Miller.

The John B. Gats Electric Welding & Mannfacturing Company, Chicago, has been incorporated with an authorized capital stock of $10,000, $6,000 issued, to operate a plant for electric resistance spot welding and butt welding and press work, at 169 North Ann St., succeeding the John B. Gats Electric Welding Works. F. H. Leslie is president of the new corporation and J. B. Gats is vice-president and general manager.

J. B. Green, president of the Chicago Steel & Wire Co., and H. S. Card, managing editor of *The Welding Engineer*, were visitors at the plant of the Universal Oxygen Company, Milwaukee, Wis., on Tuesday, October 13. The spotless condition in which this plant is kept is impressive. "Milwaukee is a busy unit of the welding industry," says S. H. Smith, manager, "and getting better all the time. Our outlook for the future seems to be a program of expansion."

Classified Ads

Help Wanted—75c per line, minimum 4 lines.
Jobs Wanted—4 lines free.
Other Ads—$1.00 per line, minimum 4 lines.
Counted 8 words to line. Add 6 words for keyed address.

Wanted—Second Hand Electric Arc Welder, 220 Volt D. C., 200 Amp. capacity, must be four bearing unit. Address 72, care The Welding Engineer.

For Sale—Flexible Shaft, Complete with Electric Motor. Used very little. Will sell cheap. Address Lon H. Weyland, 429 So. Border, Hot Springs, Arkansas.

For Sale—Welding and Blacksmith business. Will also sell residence. This is a good buy for the right party. Address L. E. Ponton, Box 638, Craig, Colorado.

Wanted—Second Hand Generator 2300 amperes. Address 73, care The Welding Engineer.

THE IDEAL TOOL FOR THE SMALL SHOP

The WODACK Portable Combination Electric Drill and Grinder saves the small shop owner money by taking care of both drilling and grinding operations. These jobs have to be done, and the WODACK Combination beats any two separate tools you can buy. WODACK makes a specialty of selling welders the electric tools that will do their work the best.

Write for our booklet "Electric Tool Facts."

Wodack Electric Tool Corporation
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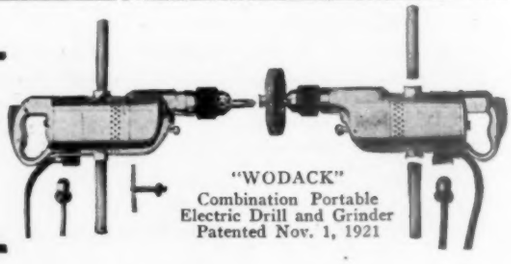

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Reliability!

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Thermit Welding, for more than twenty years, has been steadily consolidating its position in the welding field, and is now recognized wherever welds are to be made, as a method admirably adapted for use on both medium and large sections, and equally economical in both.

Thermit is prepared from only the purest materials, compounded under the supervision of a trained technical staff. Uniformity of composition is assured, and the steel produced has such high tensile strength, ductility and resistance to fatigue that it will withstand with ease the stresses and strains to which the weld is subjected.

No need to try to guess how much the member will contract on cooling! This has been accurately determined for any gap and section, and can be allowed for.

The low cost of Thermit Welding is definite, and can be counted on. We shall be glad to demonstrate this to you, and you can prove it yourself.

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Rex Welding Rods for Gas Welding
Rex Electrodes

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These products are manufactured and sold east of Detroit by the Transportation Engineering Corporation, 269 37th St., Brooklyn, N. Y.

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Patented

WELDING HELMETS
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ELECTRODE HOLDERS
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Inquiries and orders will receive prompt attention.

The same principles of metallurgy that have been so successfully applied in the welding of

High Carbon to Low Carbon Steel
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by the UNA Process of Welding and Bonding can be applied in the solution of your industrial welding problems.

If you have a real welding problem, the broad experience of this organization in meeting the welding needs of the Electric Traction and Mining Industries is at your disposal.

Your inquiries solicited

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The lightest and most comfortable goggle obtainable.

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Positive Protection from Injurious Light

Noviweld lenses in Wellsworth Welding goggles absorb 99 9/10% of the dangerous Ultra-Violet rays and 97% of the injurious Infra-Red rays. They are guaranteed by the Wellsworth Scientific Laboratories to have these protective qualities.

The color of a lens does not indicate its protective qualities. Be sure you know goggles actually protect before they are allowed in your plant.

WELLSWORTH SAFETY GOGGLES

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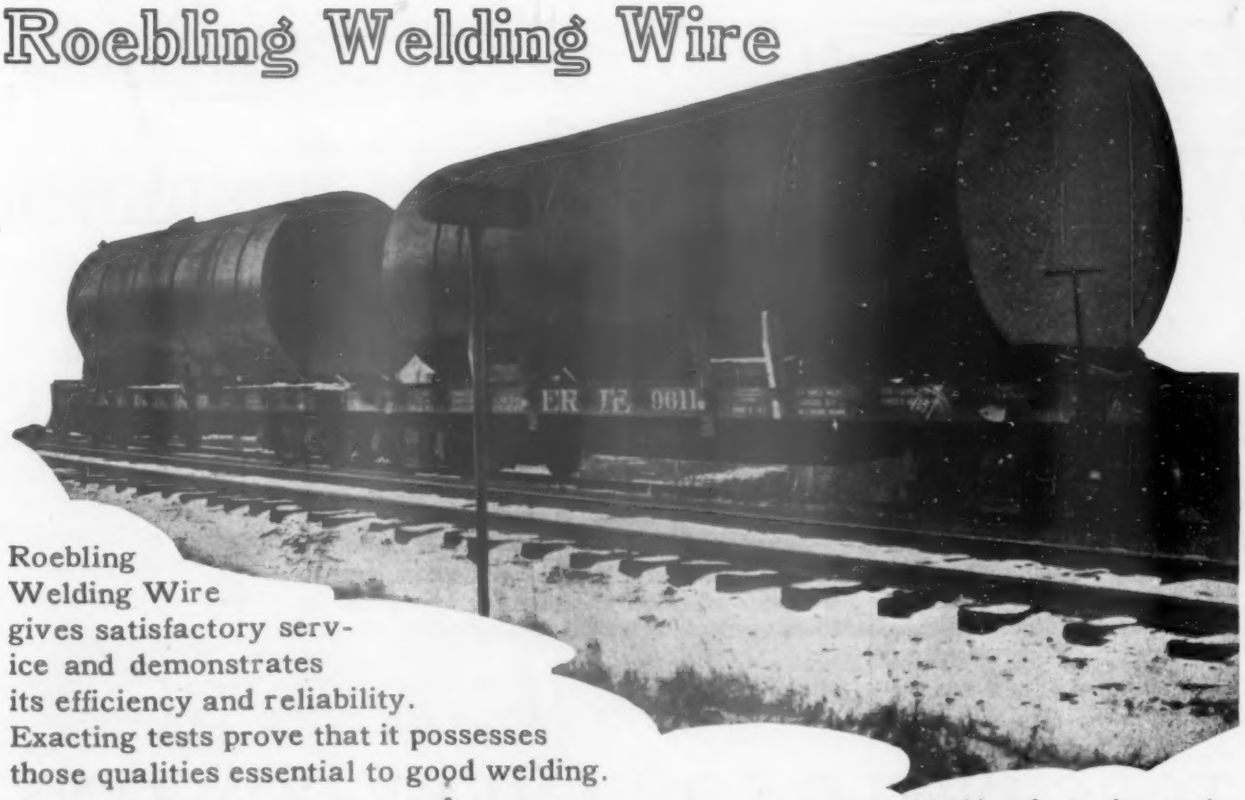
Roebling Welding Wire



Roebling Welding Wire gives satisfactory service and demonstrates its efficiency and reliability. Exacting tests prove that it possesses those qualities essential to good welding.

John A. Roebling's Sons Company, Trenton, N. J.

20,000 gal. Gasoline tanks welded with Roebling standard bright electric welding wire.

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We want every welder in the country—big or small—to be convinced of the ***specialized superiorities*** of SWEDOX products. We know that a trial ***will*** convince you. Hence the free offer. Try SWEDOX on your next welding job at our expense.

No matter what the job is, there is a SWEDOX product especially made for it. We sought and obtained from the nation's expert metallurgists and welding engineers the best analysis for each task. Science has put into SWEDOX rods and wire the proven betterments that make them the recognized standards in every case.

You'll find SWEDOX products free from impurities, uniform in analysis and therefore economical because their use reduces the cost of application and of machining.

We'll send you a sample, at our expense, enough for a thorough test—one which should prove to you, as thousands of welders know, that SWEDOX products are the standards.

SWEDOX booklet describing the products and their uses in detail, will gladly be sent upon request. Address department 4.

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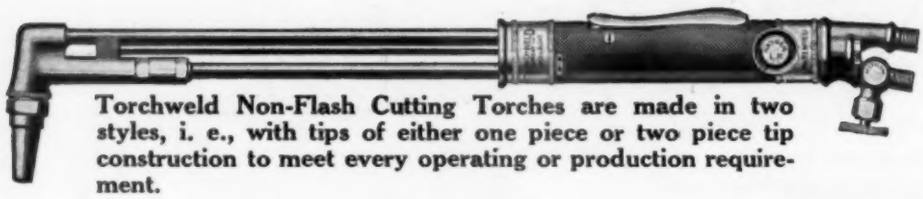
Nowhere can you purchase greater dependability, greater freedom from mechanical trouble, greater economy in operation and more durability at any price.

Torchweld Gas Welding and Cutting Equipment not only is more than sufficient for your needs, it represents the most satisfaction and service for your money.



Torchweld Non-Flash Cutting Torches are made in two styles, i. e., with tips of either one piece or two piece tip construction to meet every operating or production requirement.

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Monolithic filler performs its safety function throughout years of service and abuse because its strength and structure positively prevent any sagging or disintegration. Voids absolutely cannot occur in properly constructed monolithic filled cylinders.

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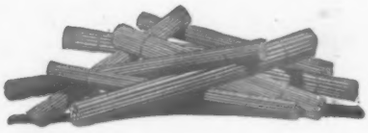

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for repairing Scored Cylinders and Water Jackets, etc. Thoroughly tried for several years by our customers and found entirely satisfactory.

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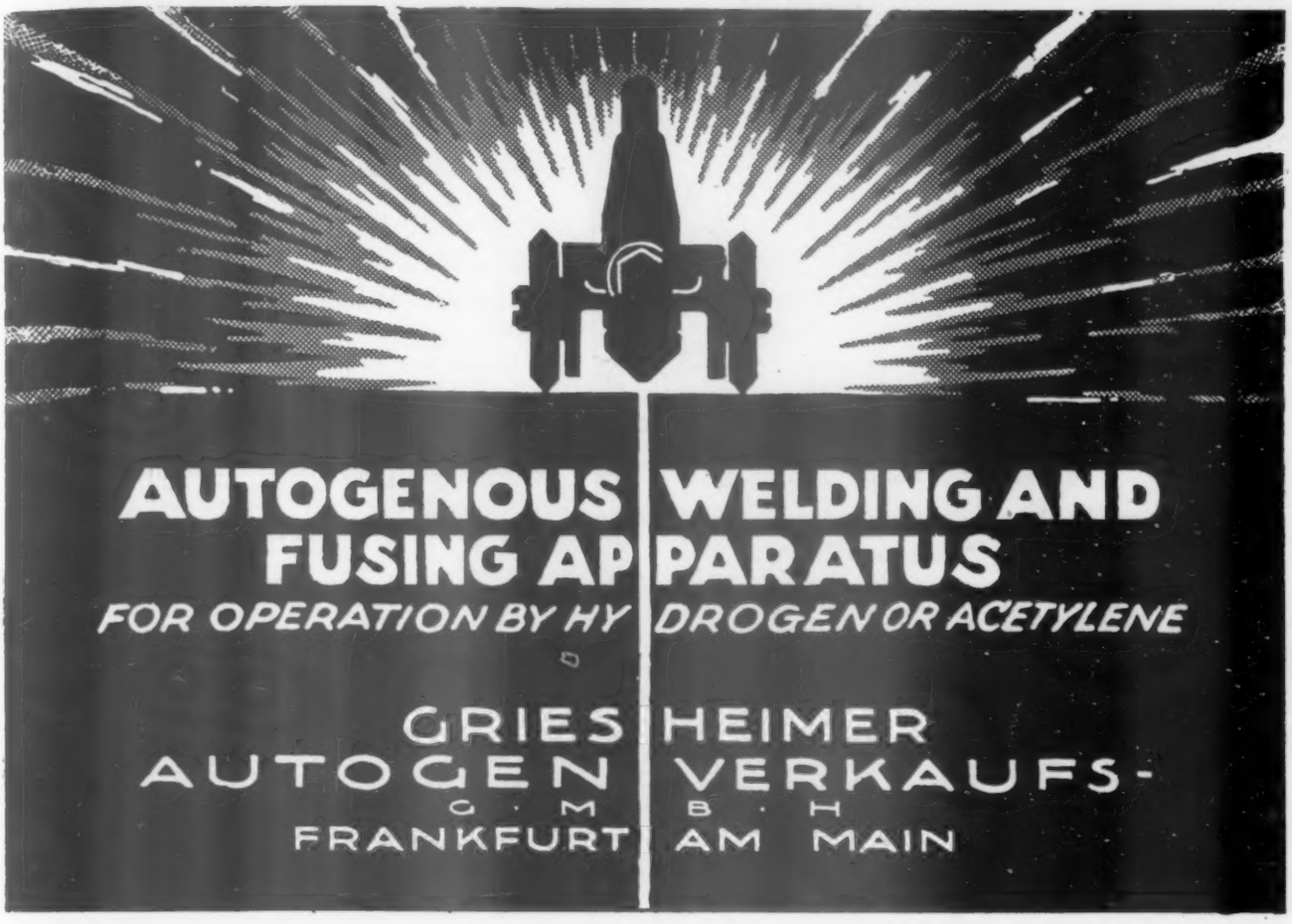

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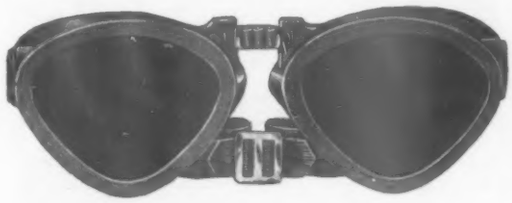

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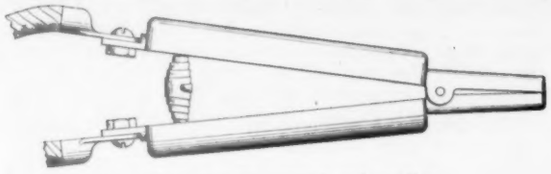

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They are Wire Savers, as well as Time Savers.

Wire can be burned down to a very small remnant.

Note how far away from the heat the spring is placed.

Handle, complete with cable	**$9.00**
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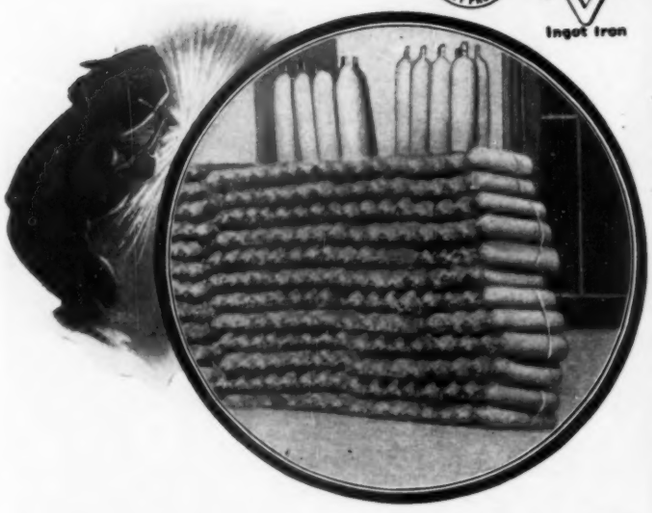

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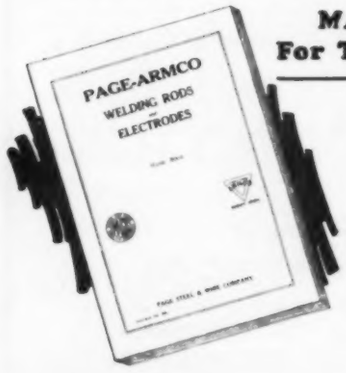

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The Ideal Apron for Welders is made of leather which has been especially treated to stand the heat, and at the same time be very flexible and durable.

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ROL-MAN MANGANESE STEEL for MAXIMUM WEAR

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A True High Manganese and High Carbon Product in Rolled Rods and Drawn Wire Presents Highest Abrasive Resistance and Maximum Wearing Qualities

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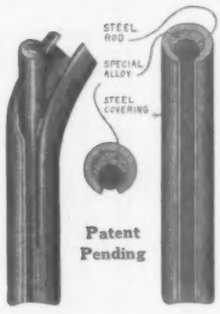

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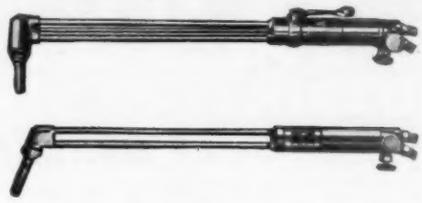

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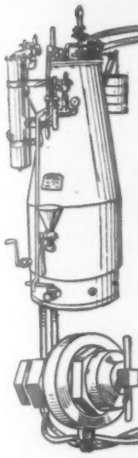

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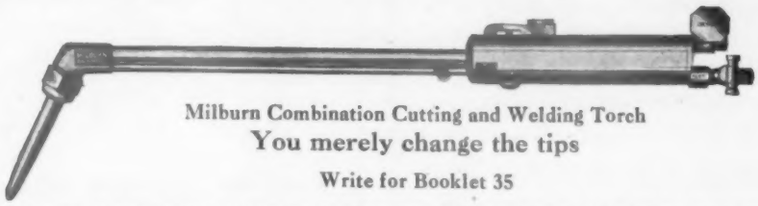

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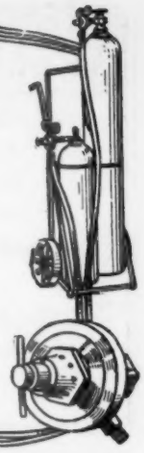

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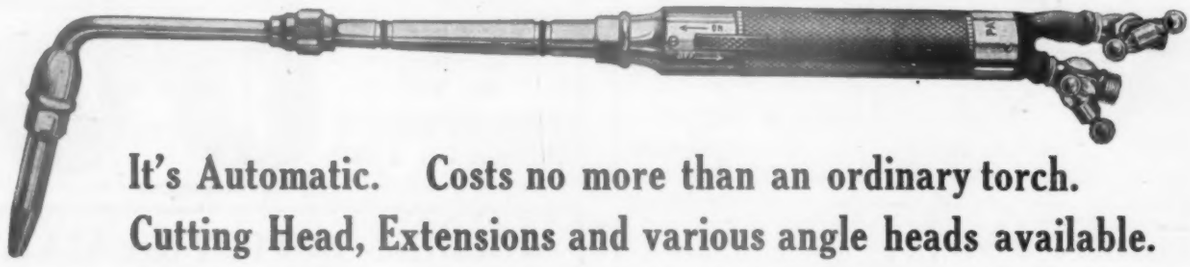

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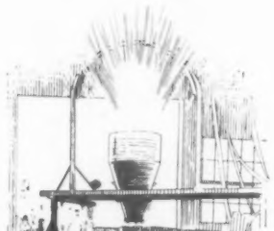

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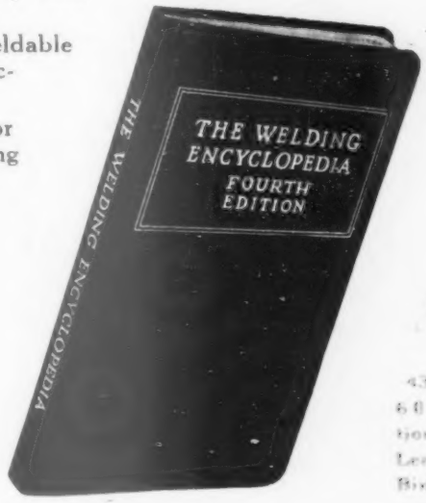

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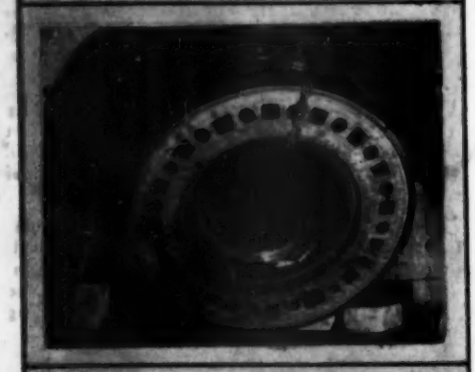

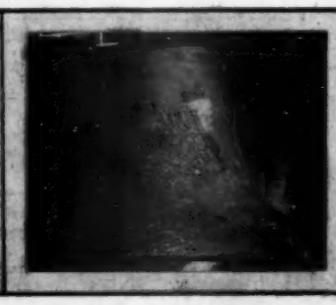

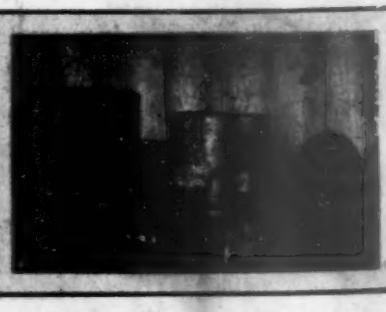

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